



Armed Forces College of Medicine AFCM



PHARYNX and LARYNX

By

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INTENDED LEARNING OBJECTIVES (ILO)



By the end of this lecture the student will be able to:

1. Identify general features of pharynx
2. Enumerate the cartilages of larynx
3. Identify laryngeal ligaments & membranes.
4. Identify laryngeal cavity, boundaries of inlet & rima glottidis.
5. State the sensory nerve supply of larynx.
6. Name intrinsic muscles of larynx ,their actions and nerve supply.

Lecture Plan



1. Part 1 (5 min) Introduction to pharynx
2. Part 2 (35 min) larynx
3. Part 3 (5 min) applied anatomy
4. Lecture Quiz (5 min)

Anatomy of the Pharynx



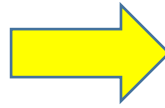
THE PHARYNX



Definition: it is a half-cylinder muscular tube

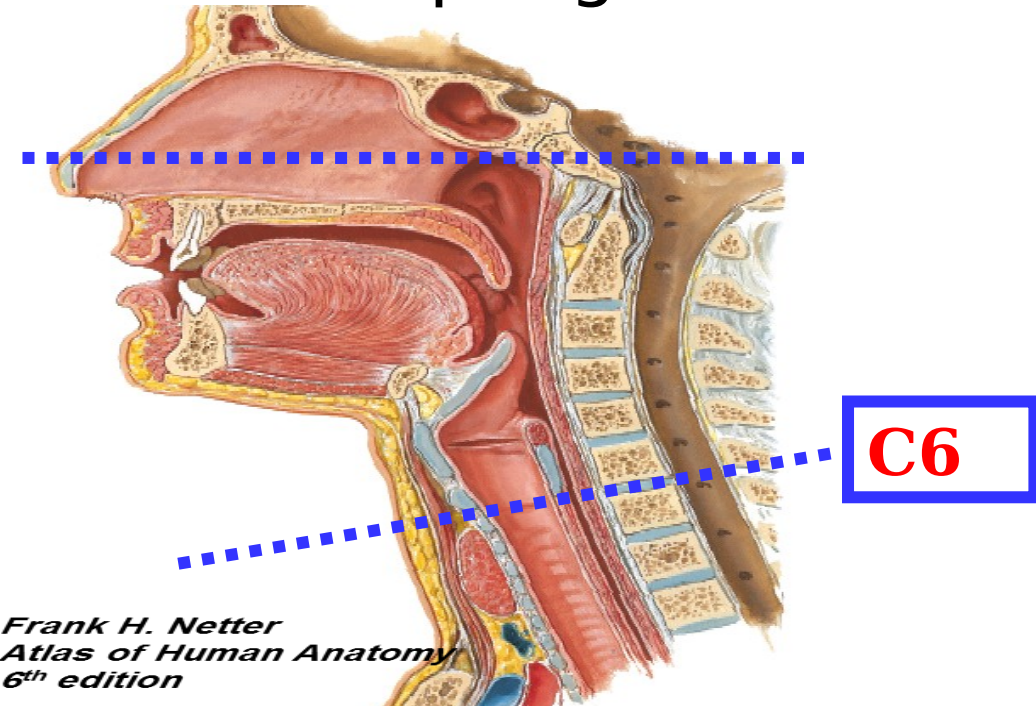
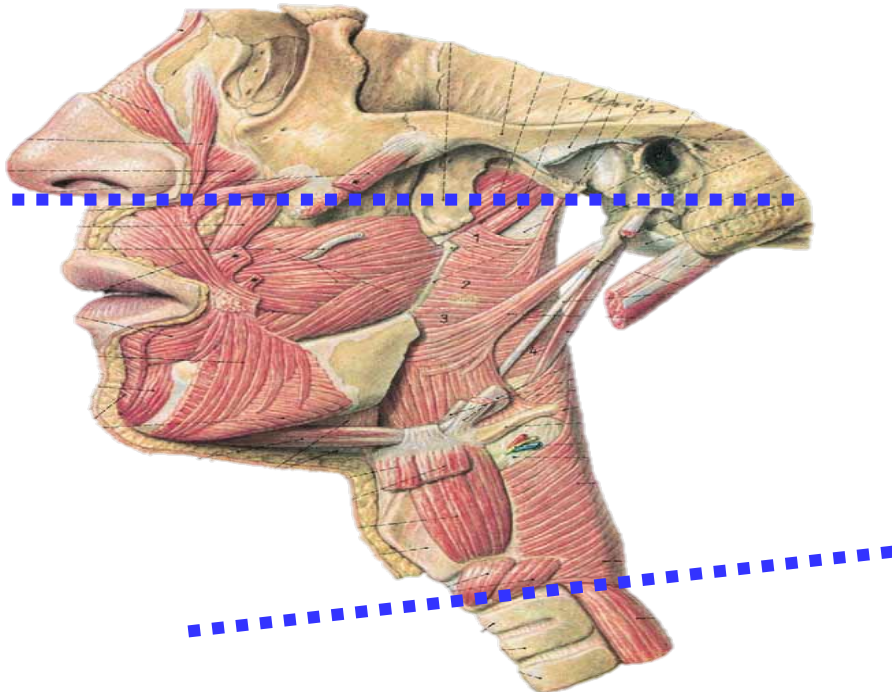
Superiorly:

It begins at base of the skull



Inferiorly:

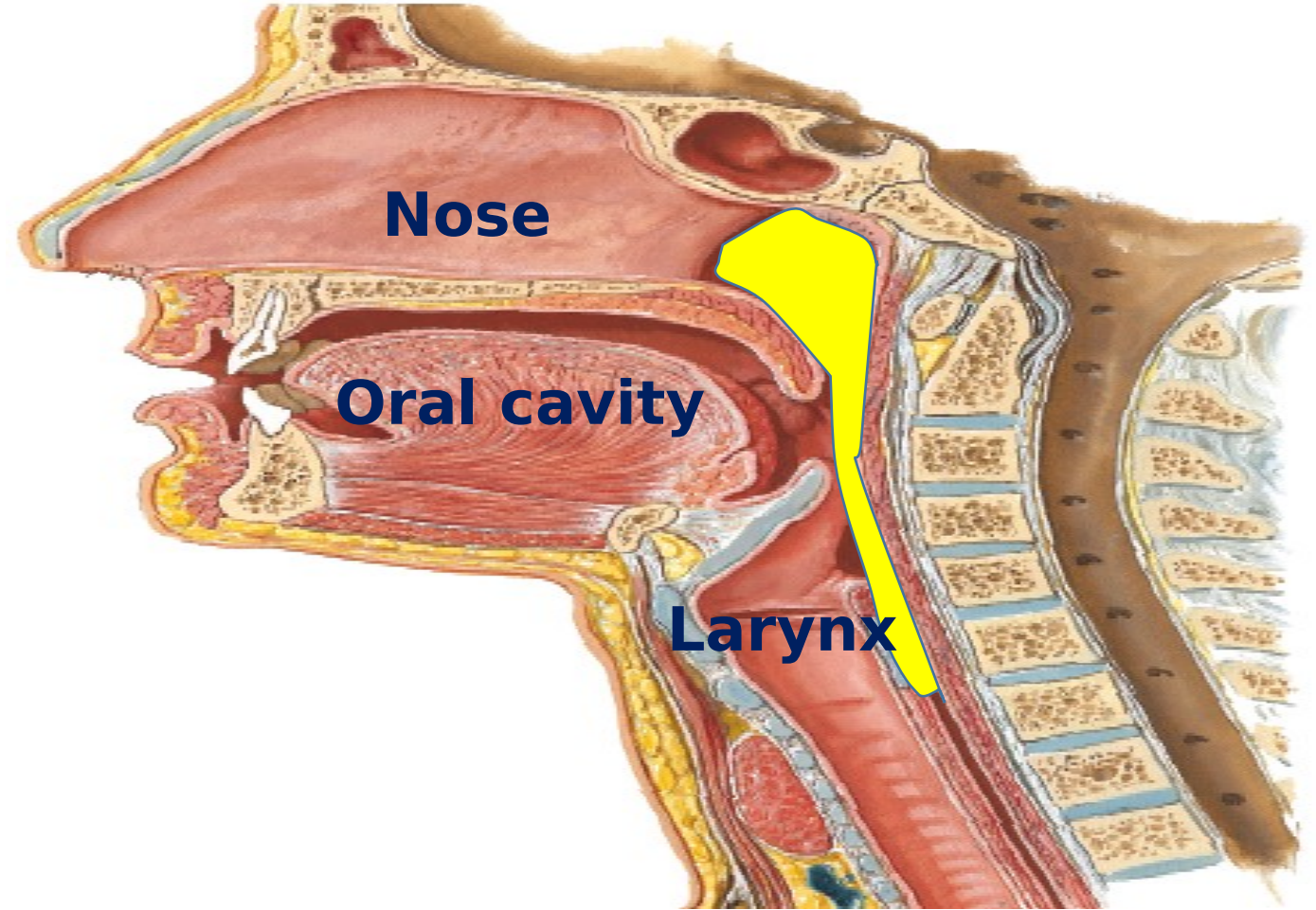
lower border of cricoid cartilage (C6) Continues as the esophagus



THE PHARYNX



- ❑ situated behind nose, mouth & larynx.
- ❑ It connects the oral and nasal cavities in the head to the larynx and esophagus in the neck.



*Frank H. Netter
Atlas of Human Anatomy
6th edition*

THE PHARYNX



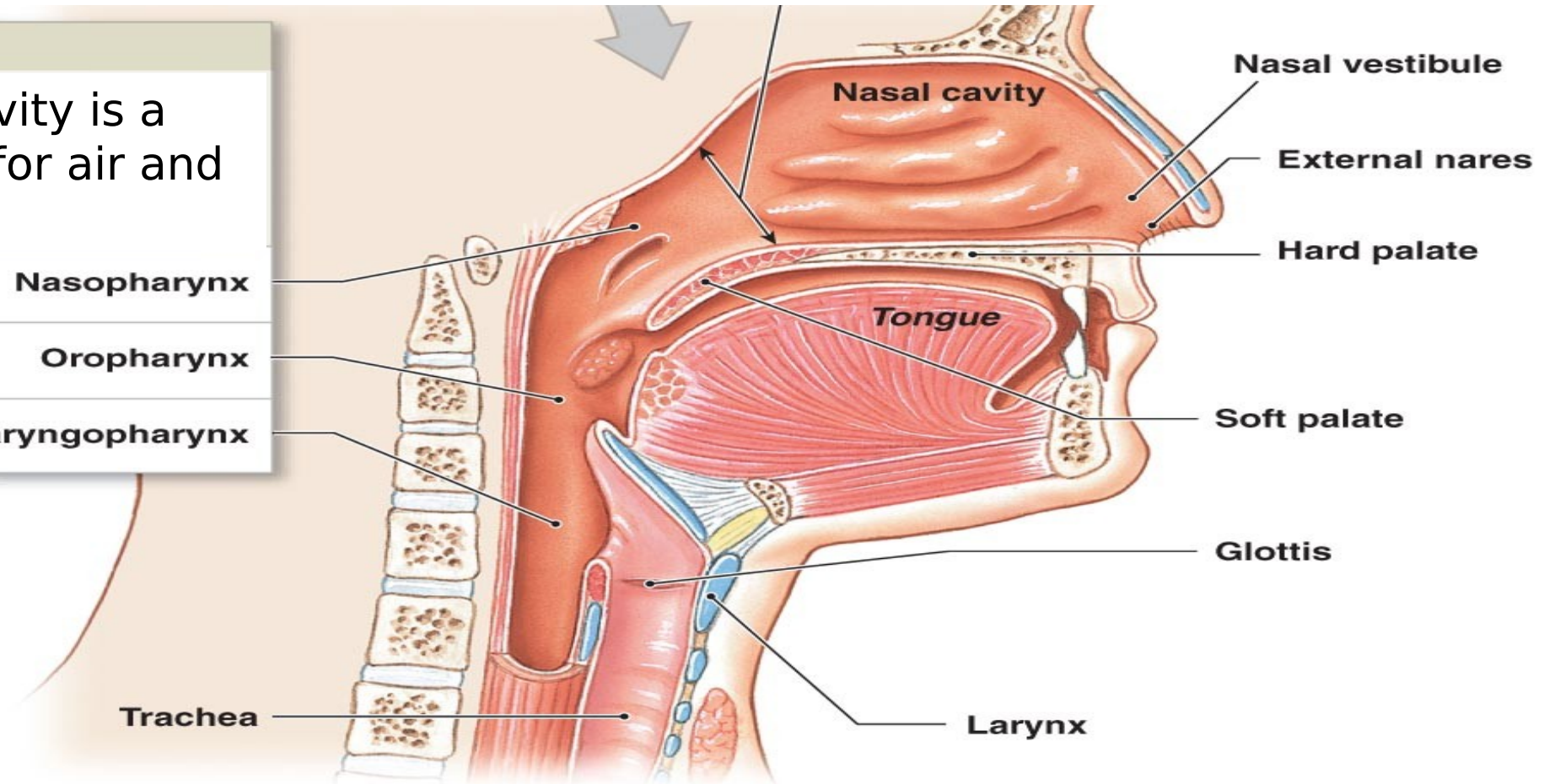
Pharynx

- ❑ The pharyngeal cavity is a common pathway for air and food.

Nasopharynx

Oropharynx

Laryngopharynx



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Parts of the PHARYNX

❑ **It is divided into 3 parts:**

1

Nasopharynx

2

Oropharynx

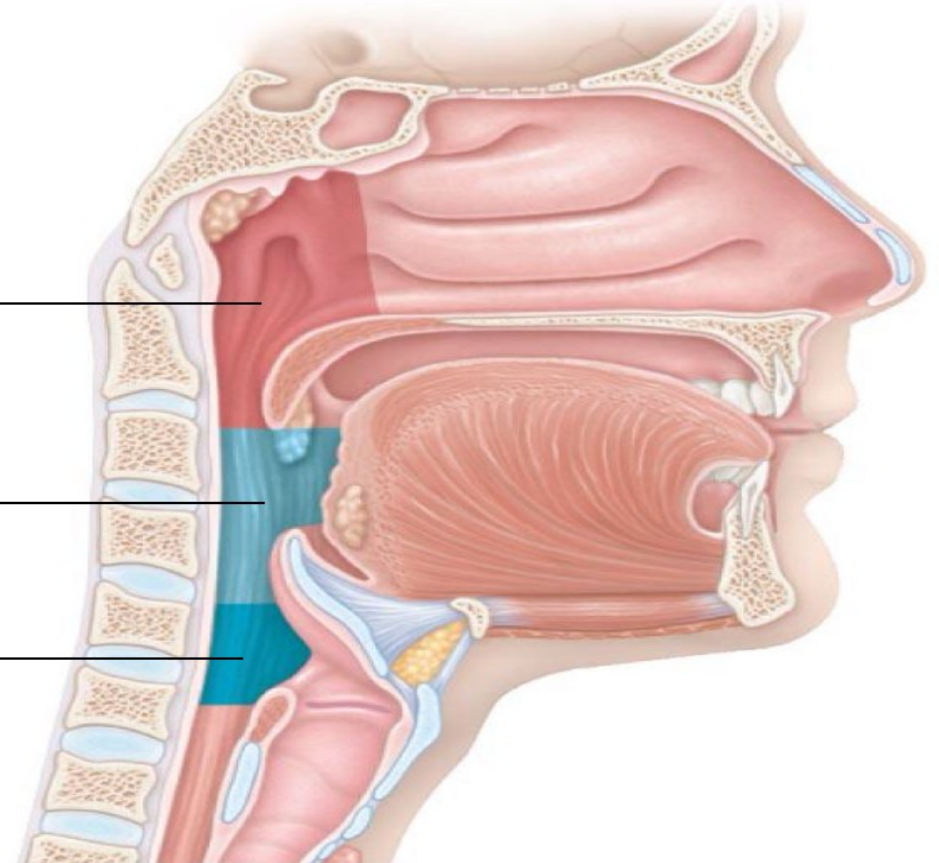
3

Laryngopharynx

nasal part of pharynx

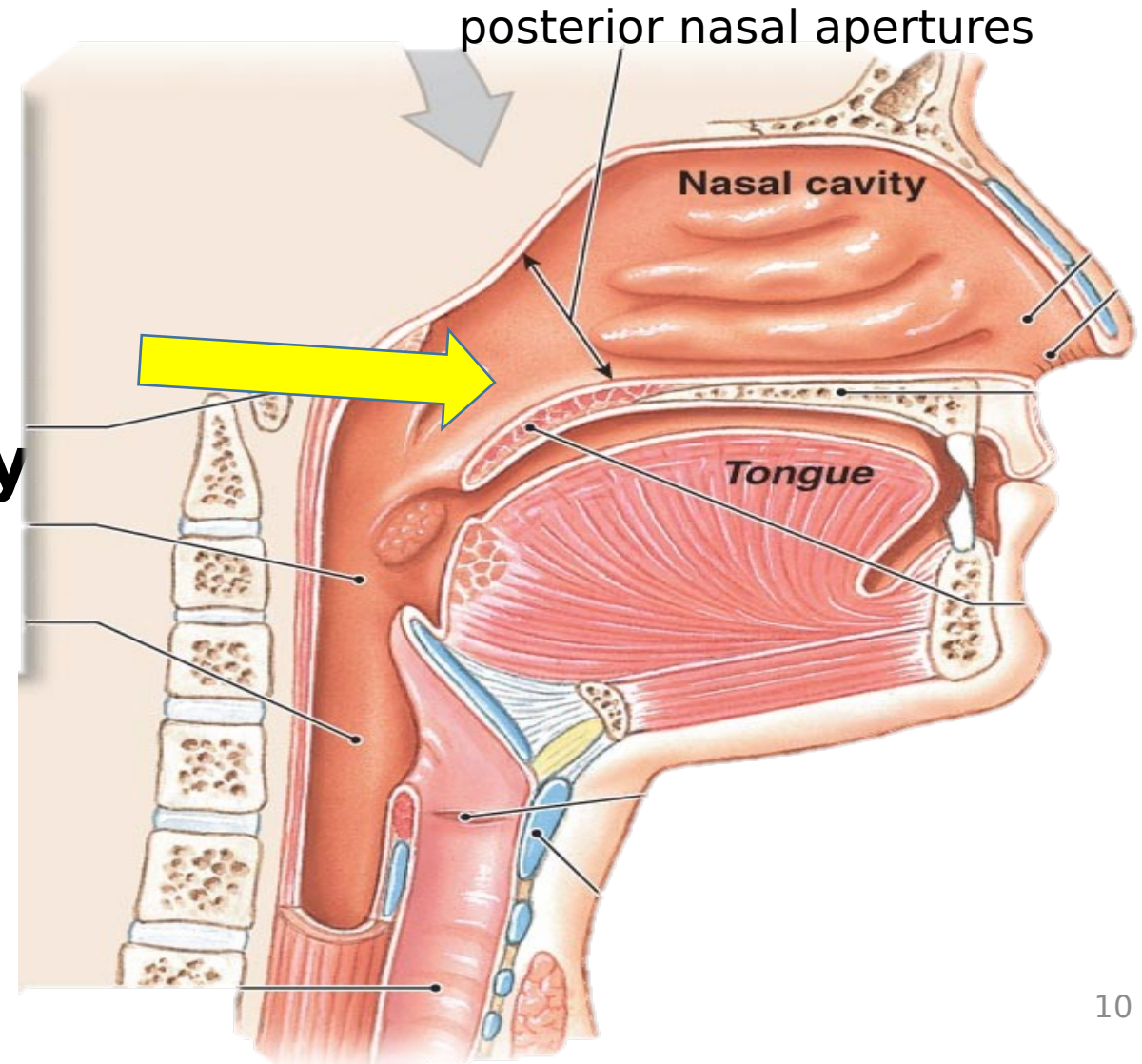
oral part of pharynx

aryngeal part of pharynx



NASOPHARYNX

- ❑ lies behind the nasal cavities
- ❑ Its Anterior wall is missing
- ❑ Connected to the nose by the posterior nasal apertures (*choanae*).
- ❑ Its related inferiorly to **Soft palate.**



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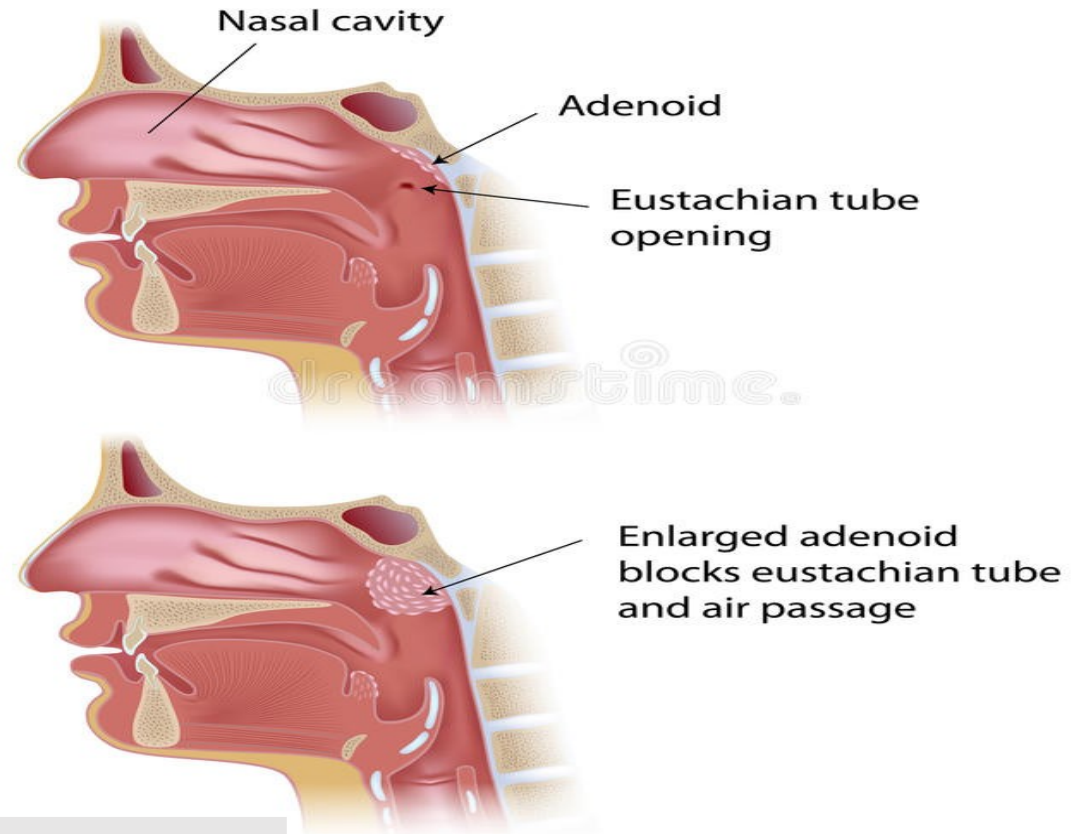
NASOPHARYNX

pharyngeal tonsil
= **adenoids**

- Increase in size till age :6-7 years
- Then starts to atrophy

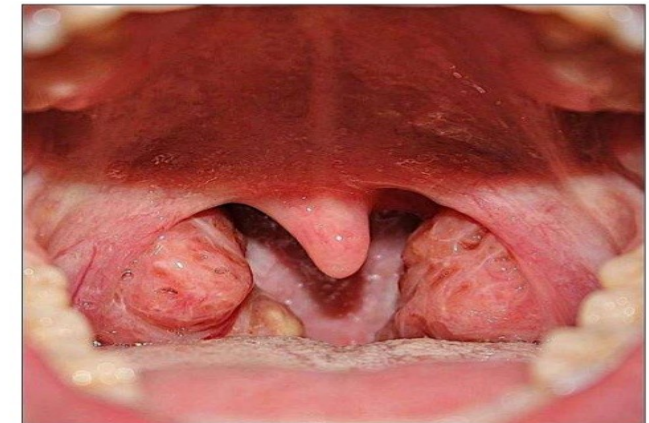
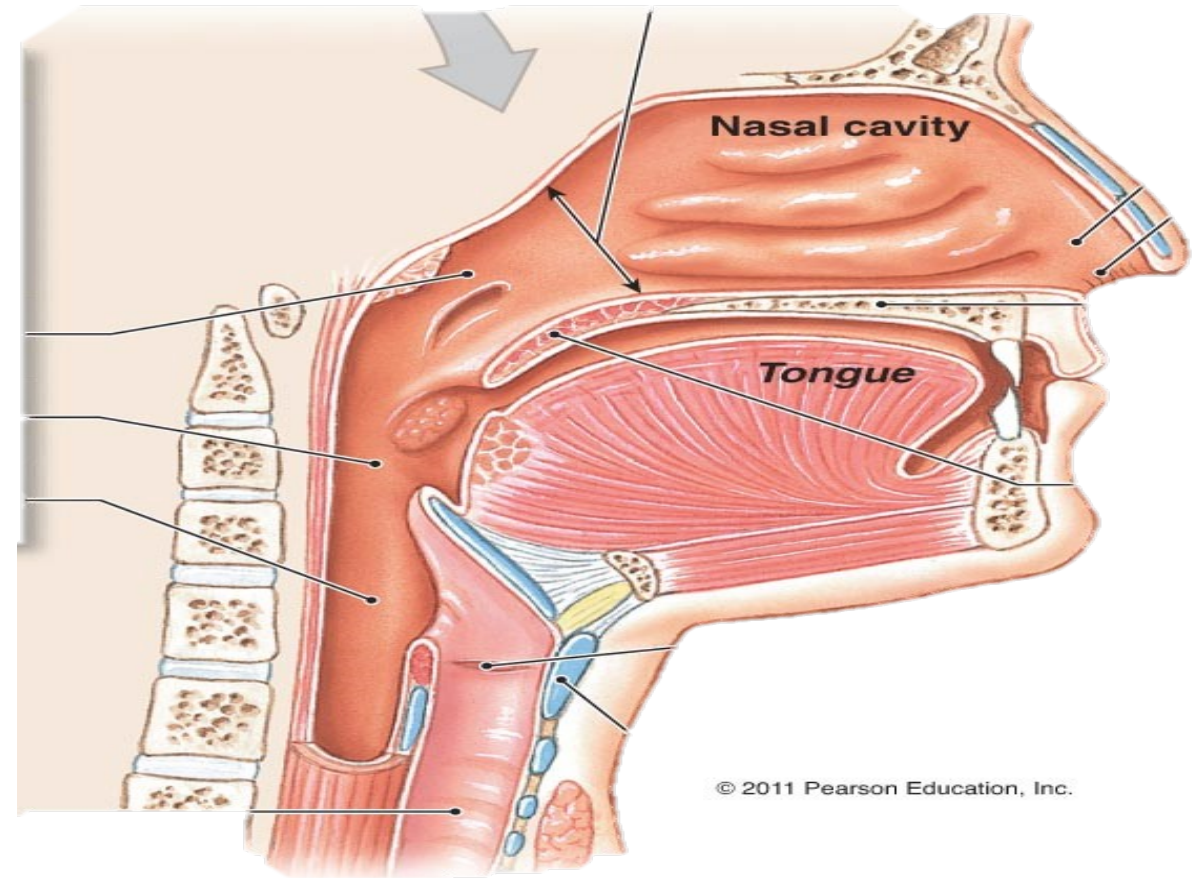
If enlarged in children it causes
adenoids hypertrophy

- obstructs air flow from nose to pharynx
- child breathes through mouth



Oropharynx

- ❑ lies behind the **oral cavity**
- ❑ with a large lymphoid mass lying in = palatine tonsil
- ❑ Inflammed palatine tonsil --> **tonsillitis**
- ❑ removal of the tonsil = **Tonsillectomy**

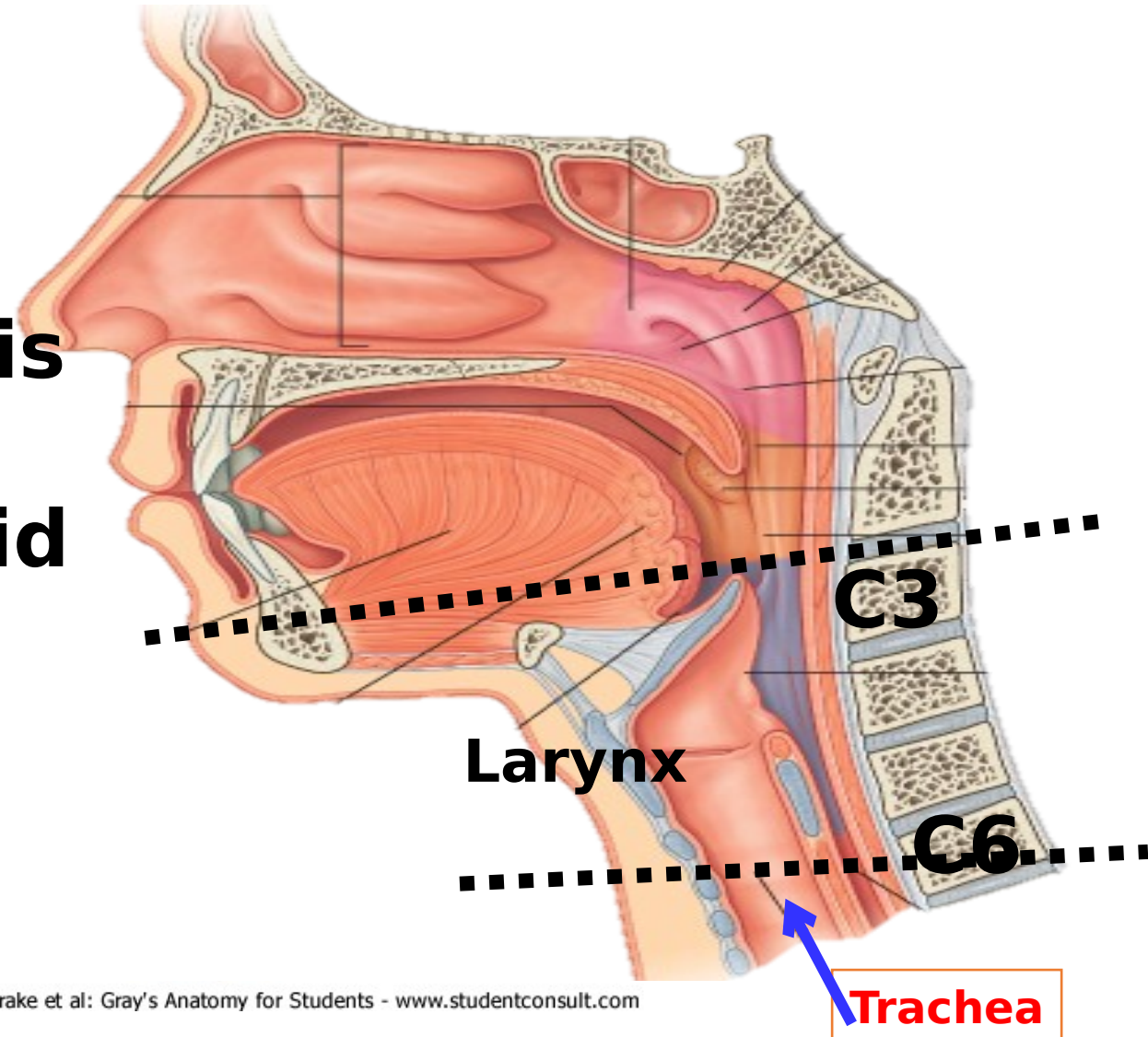


Larynx

Larynx



- ❑ Lies in midline of neck
- ❑ extending from Epiglottis (root of tongue)
- ❑ to (lower border of cricoid cartilage = C6
- ❑ where it Continues as **Trachea**



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Larynx



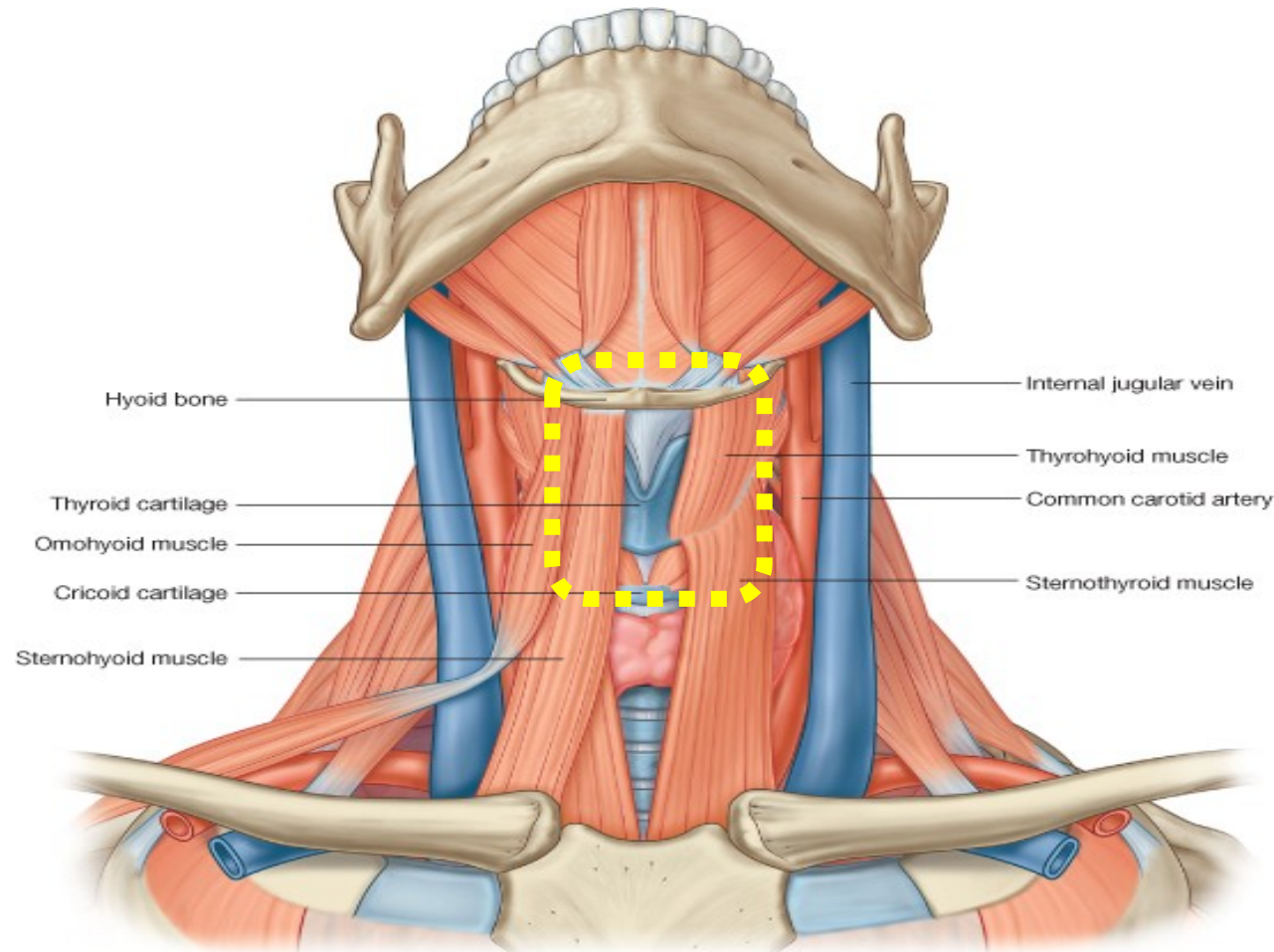
Relations:

Anteriorly:

- Skin
- Superficial fascia
- deep fascia
- infrahyoid muscles.

Posteriorly:

- laryngeal pharynx
- upper part of esophagus.



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Larynx



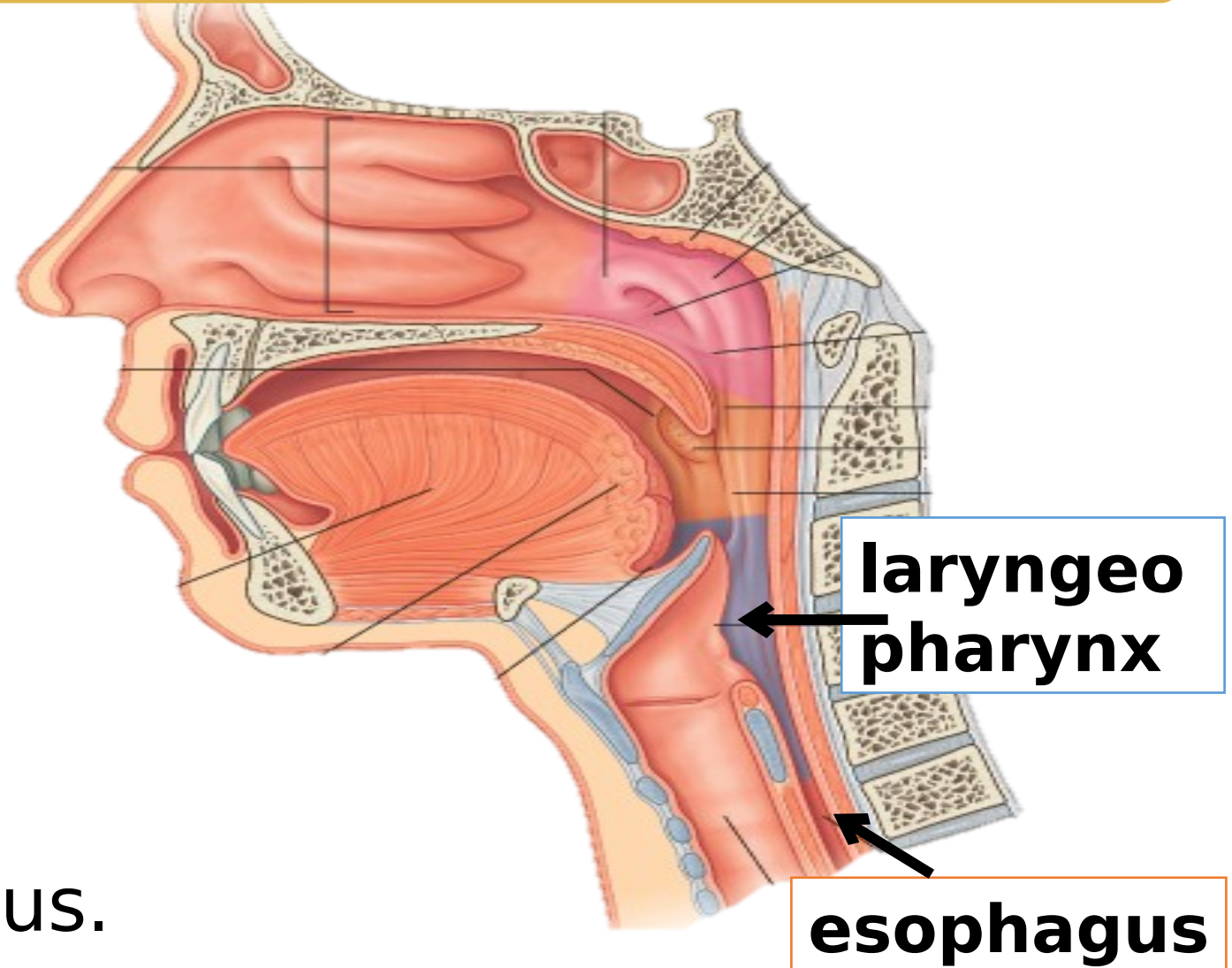
Relations:

Anteriorly:

- Skin
- Superficial fascia
- deep fascia
- infrahyoid muscles.

Posteriorly:

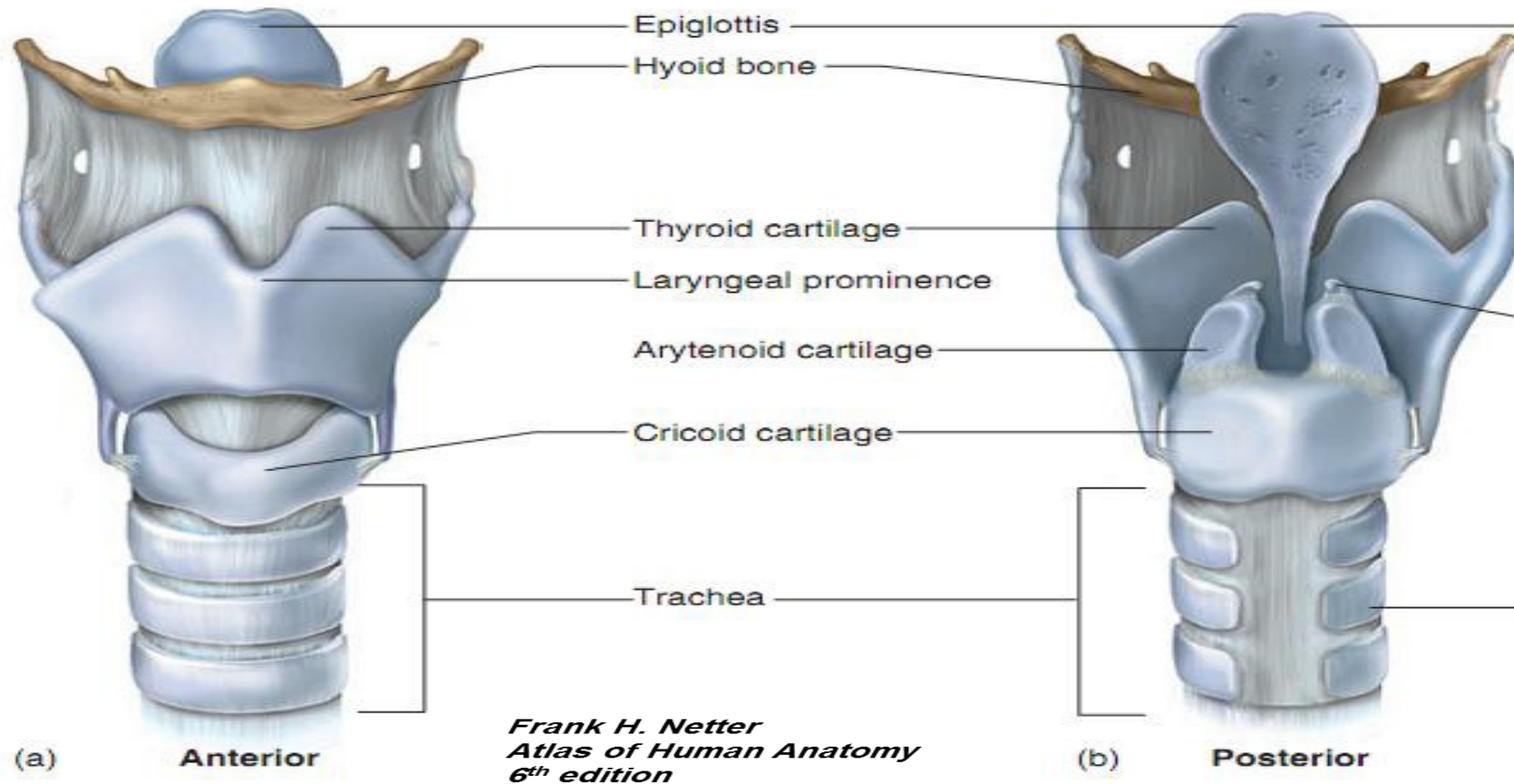
- laryngeal pharynx
- upper part of esophagus.



Larynx



Cartilages of the larynx



Larynx



Cartilages of the larynx

Single:
3

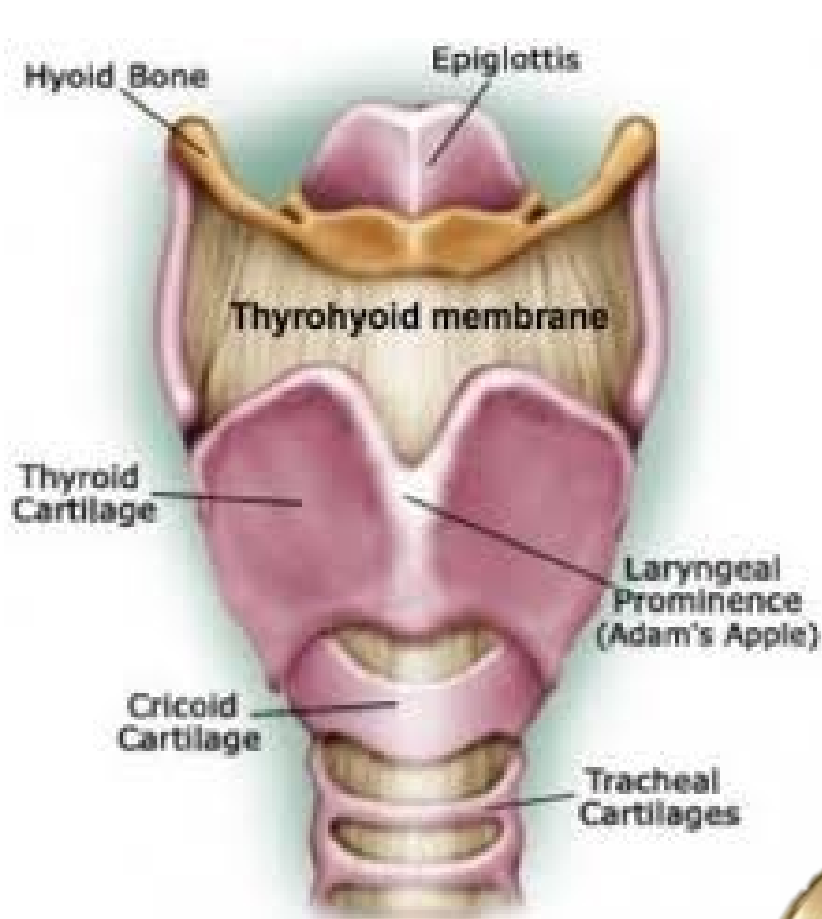
- ☐ Epiglottis
- ☐ Thyroid cartilage
- ☐ cricoid cartilage



Paired :
3

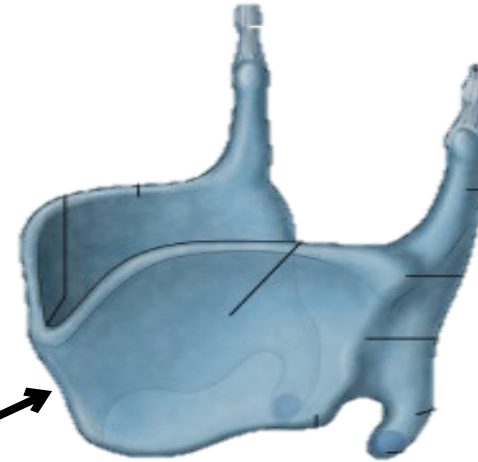
- ☐ Arytenoid
- ☐ Corniculate
- ☐ cuneiform.

Single Cartilages of the larynx



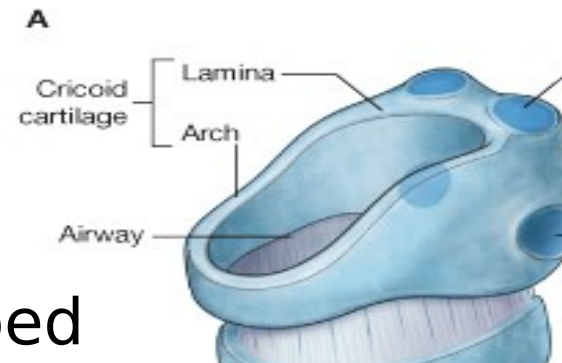
laryngeal prominence

Thyroid Cartilage



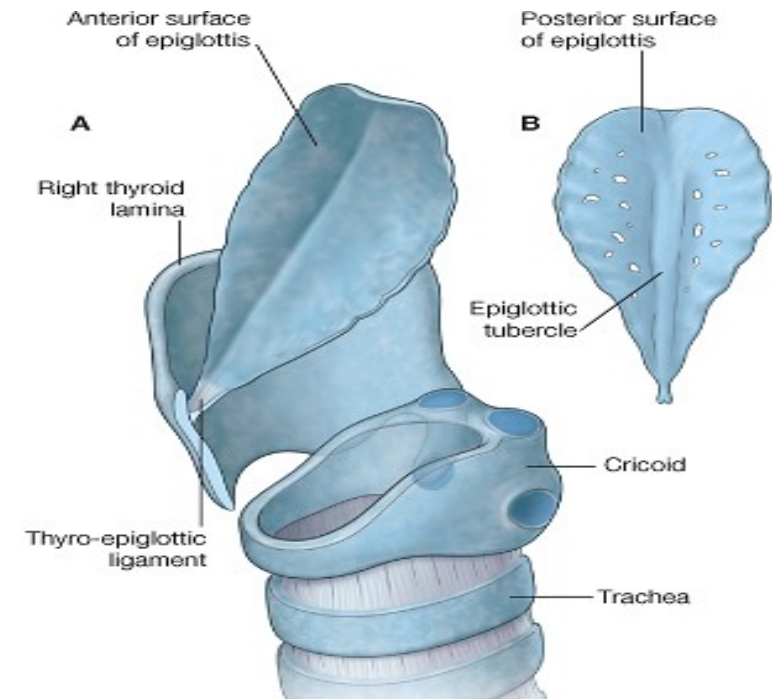
Signet **ring** shaped

Cricoid cartilage



Epiglottis

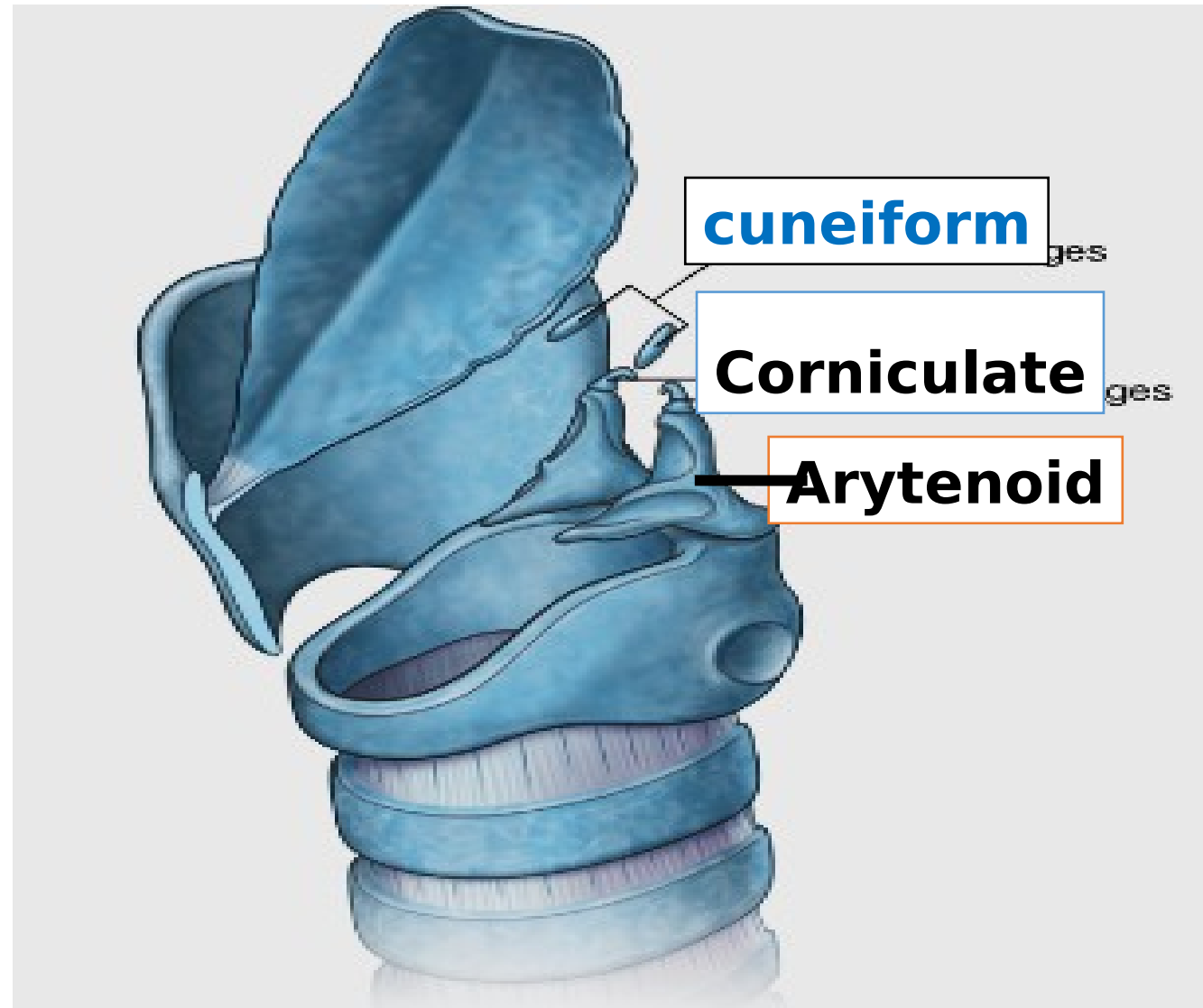
Leaf shaped
midline cartilage



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Paired : **3**

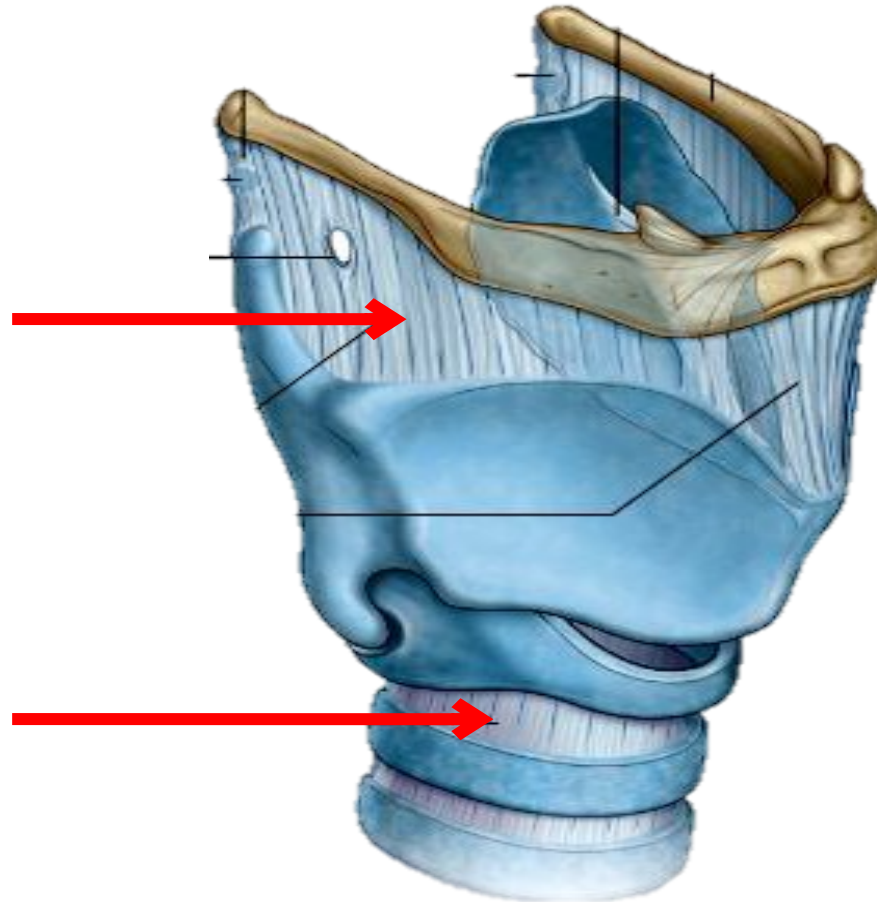
- ☐ Arytenoid
- ☐ Corniculate
- ☐ cuneiform.



Extrinsic ligaments:

1-Thyro-hyoid
membrane

2- Crico-
tracheal
ligament



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Intrinsic ligaments:

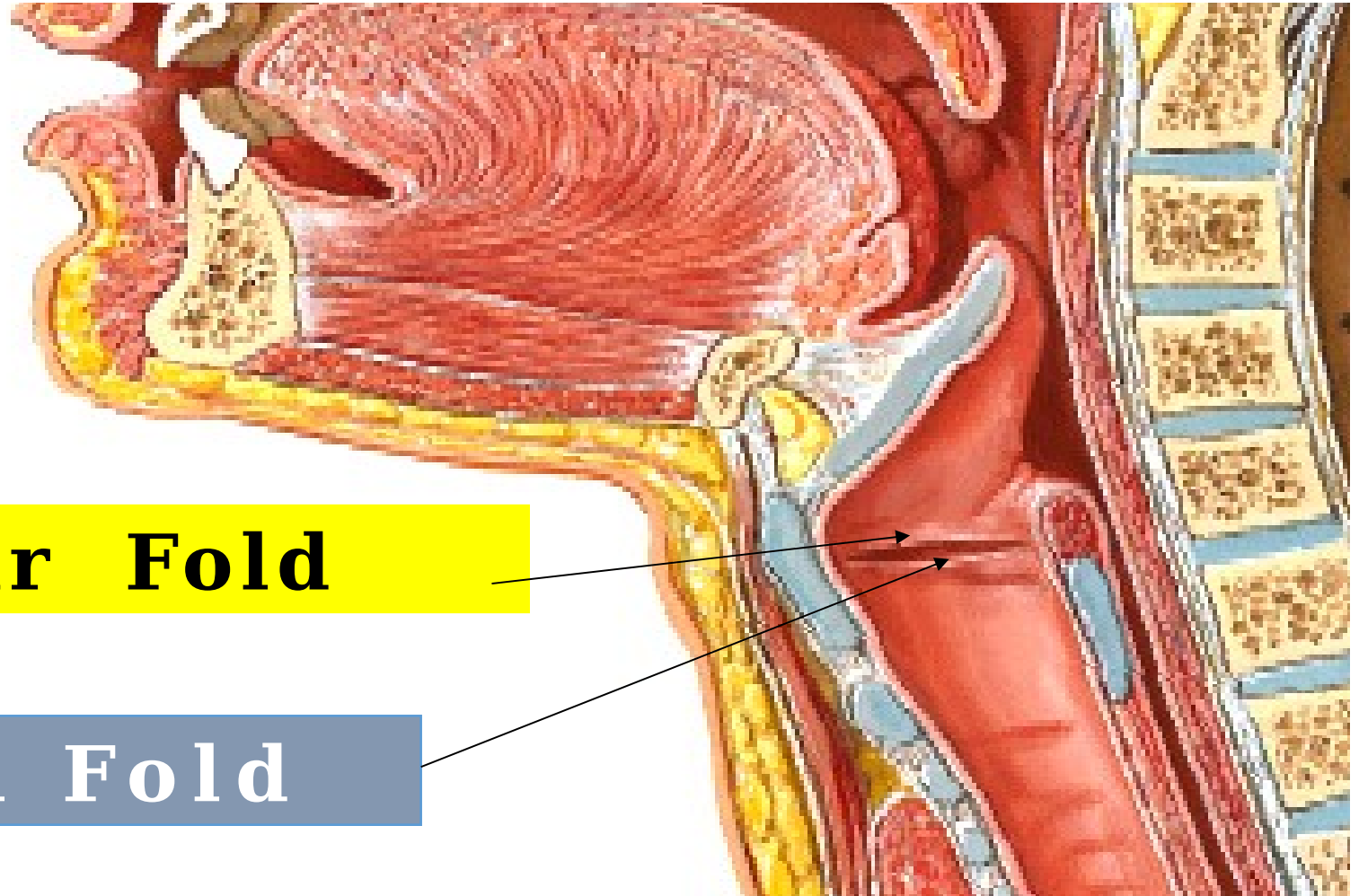


**False
vocal
folds**

Vestibular Fold

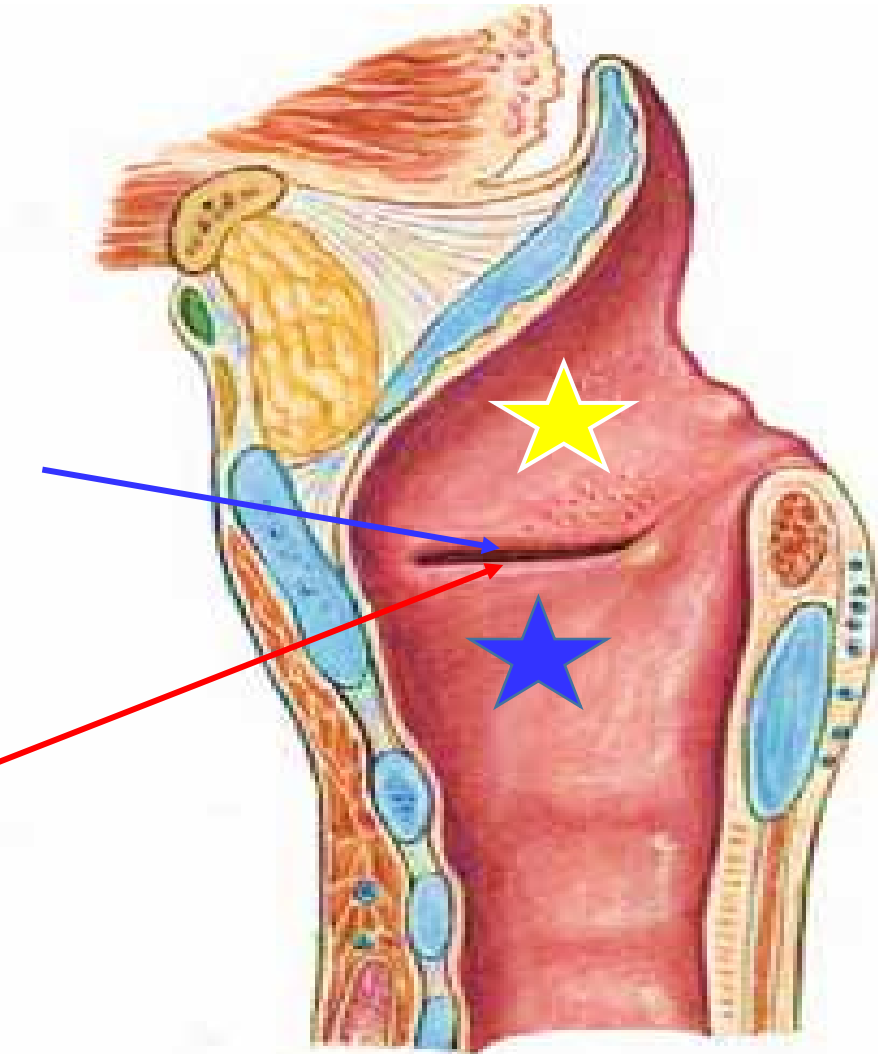
**True
vocal
folds**

Vocal Fold

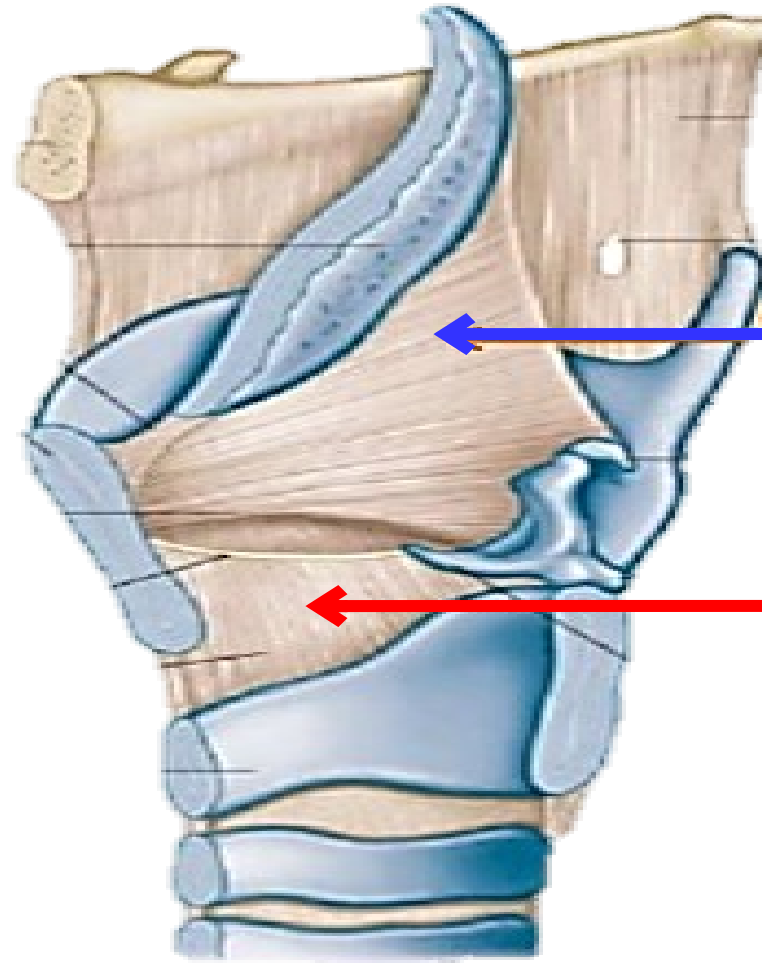


*Frank H. Netter
Atlas of Human Anatomy
6th edition*

Intrinsic ligaments:



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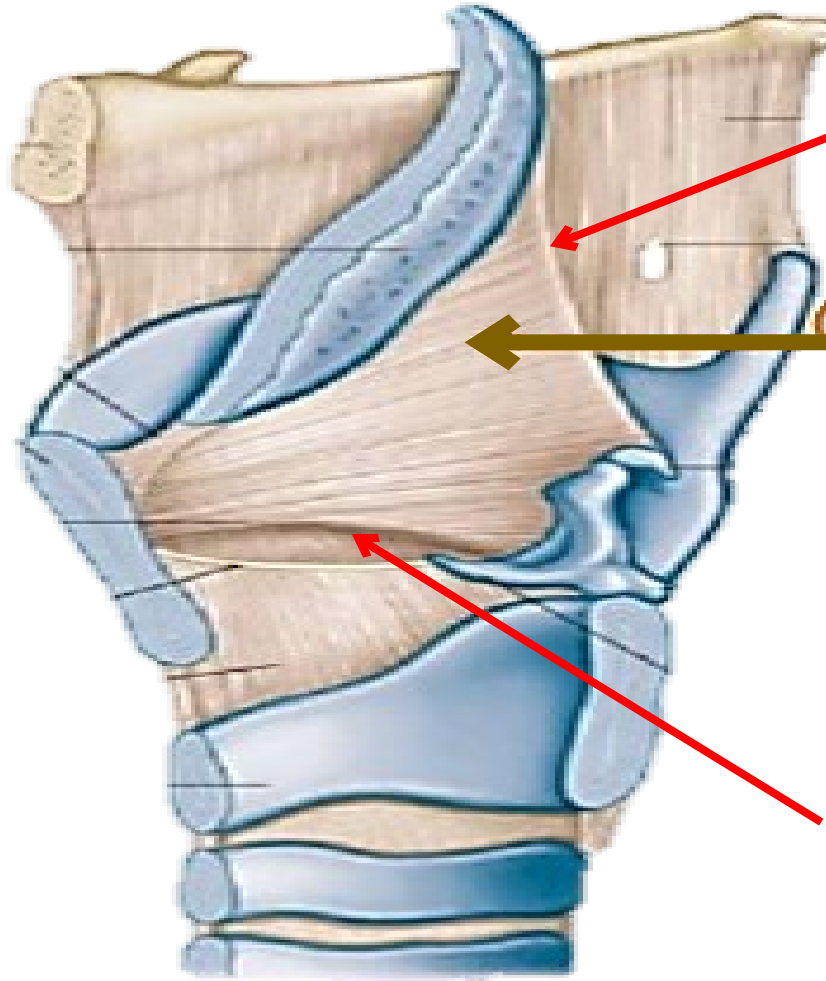


**Quadrangular
membrane**

**Cricothyroid
membrane**

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Intrinsic ligaments:



- The free upper margin form **Aryepiglottic fold**

quadrangular membrane

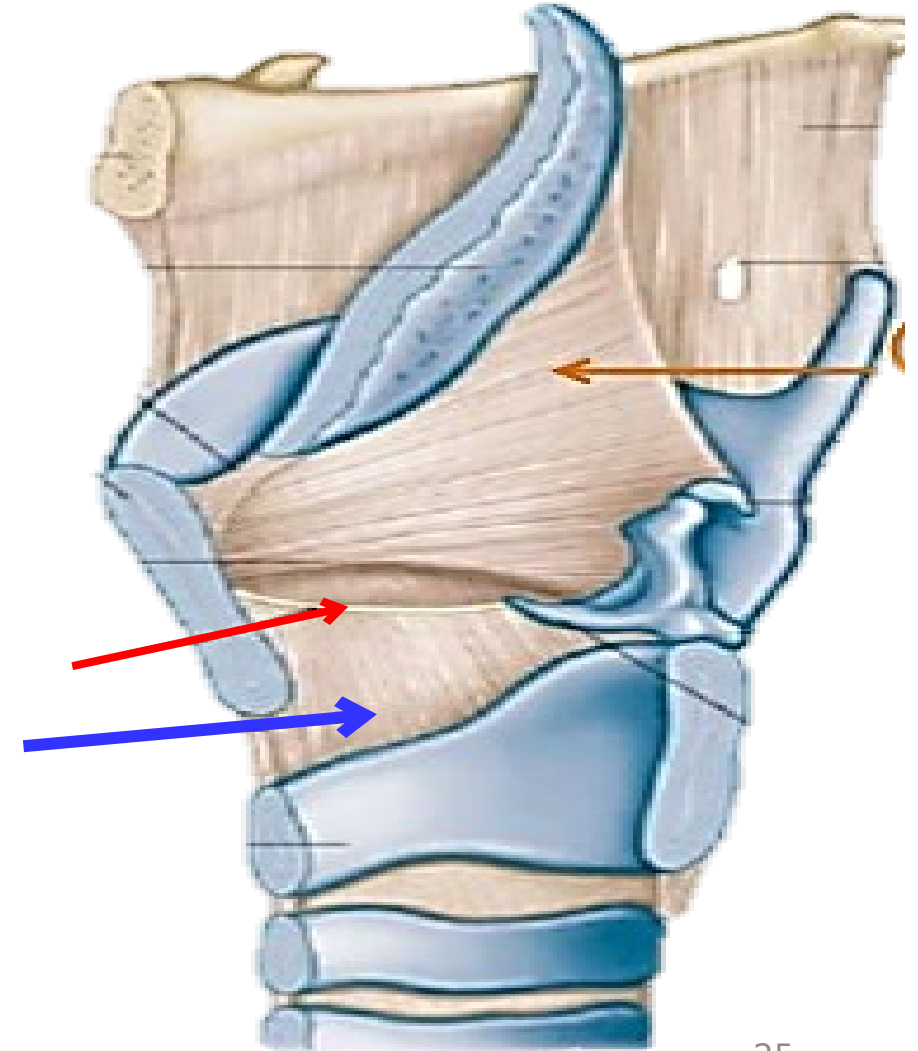
- It extends between **epiglottis**
- to **arytenoid** and **corniculate** cartilage on the same side
- The free lower margin form the **vestibular ligament** under the **vestibular fold** (*false vocal cord*).

Intrinsic ligaments:



Cricothyroid Ligament

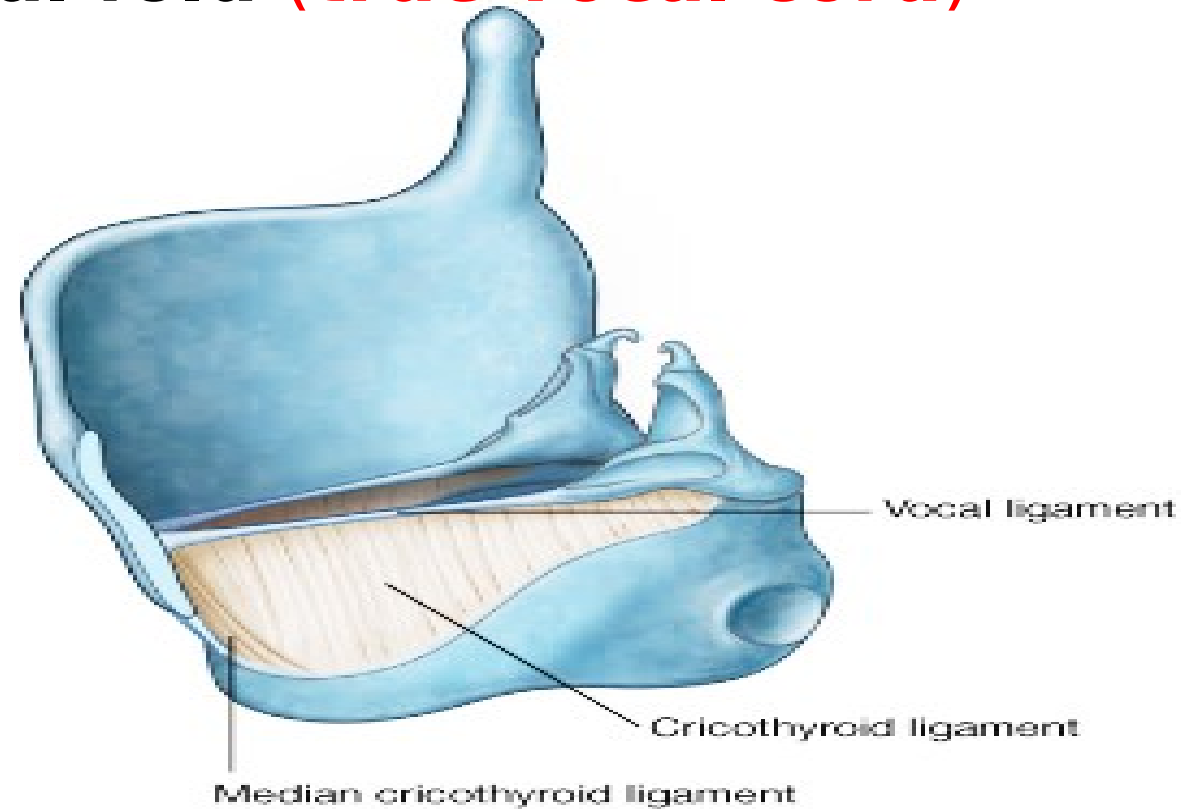
- ❑ It has a ***free upper margin*** which form
❑ **vocal fold (true vocal cord)**
- ❑ It is attached to **arch of cricoid cartilage**
- ❑ **Extended** between **thyroid cartilage and arytenoid cartilages (vocal processes)**



Intrinsic ligaments:

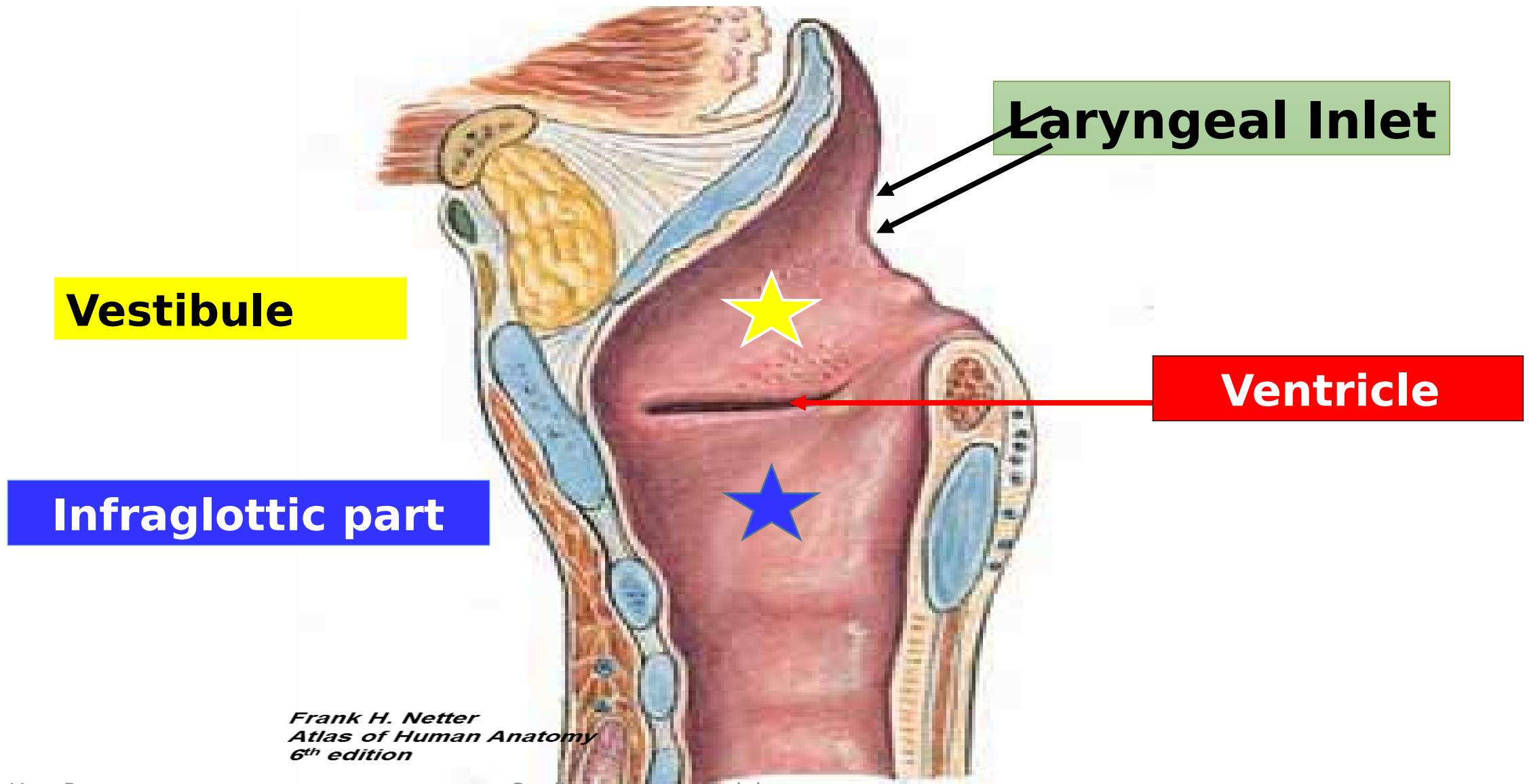


□ **CricoThyroid Ligament**
free upper margin form □
vocal fold (true vocal cord)



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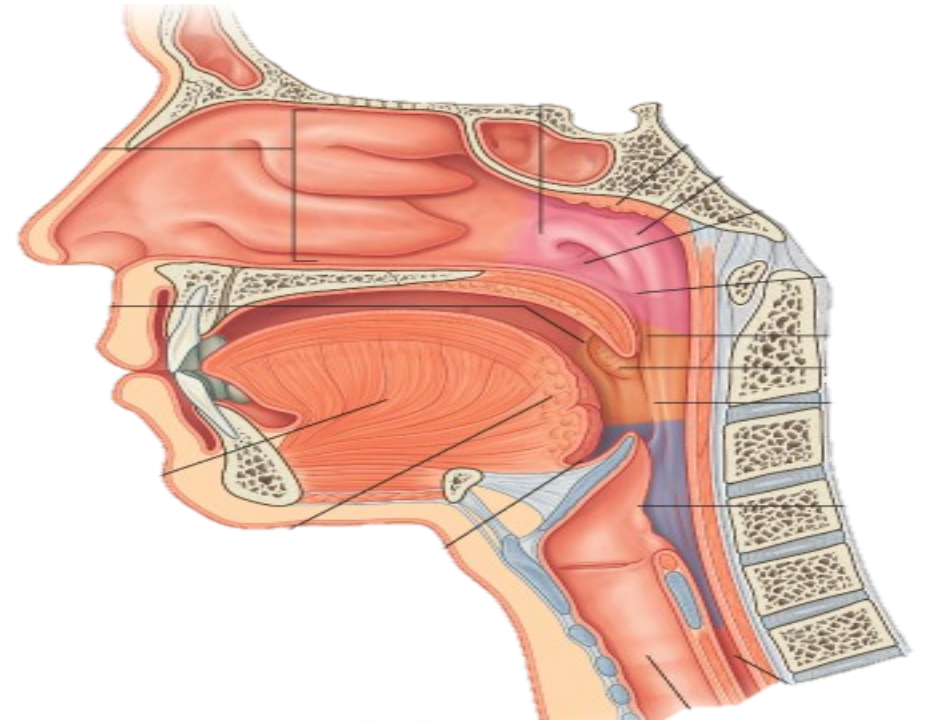
Intrinsic features :



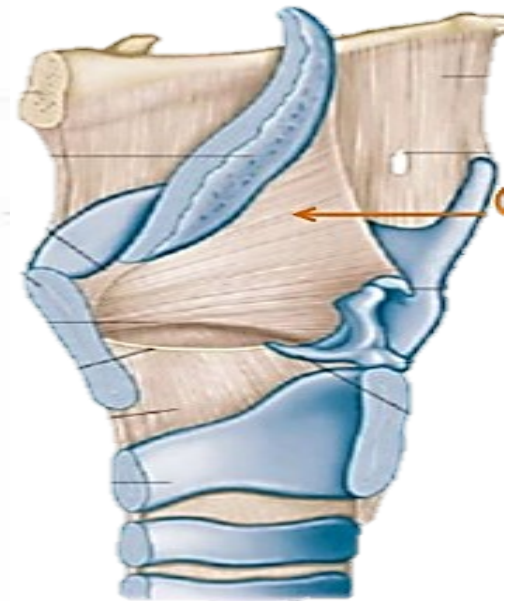
Frank H. Netter
Atlas of Human Anatomy
6th edition

Laryngeal Inlet:

- it is **the superior aperture**
- below and posterior to the **tongue**
- Anterior to **pharynx**
- **anterior border** → **epiglottis;**
- **lateral borders** →
(aryepiglottic folds)
- **posterior border** →
mucosal fold between the two
corniculate tubercles



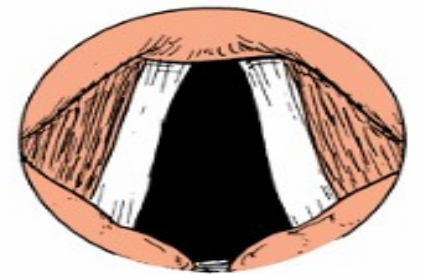
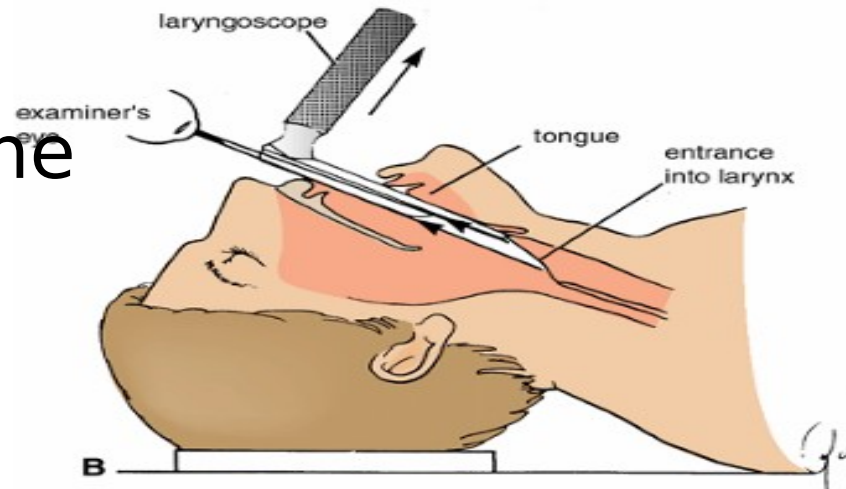
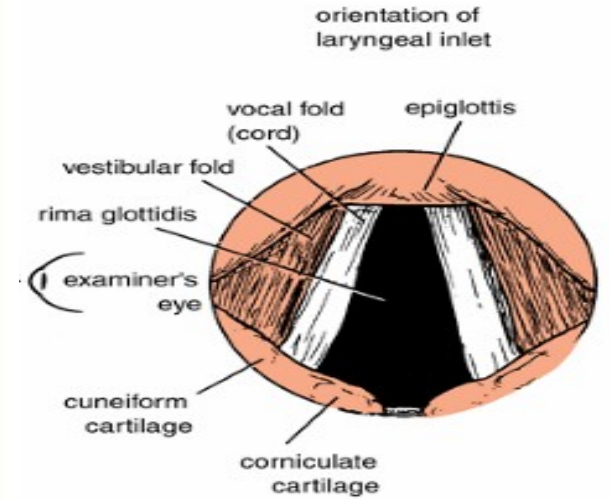
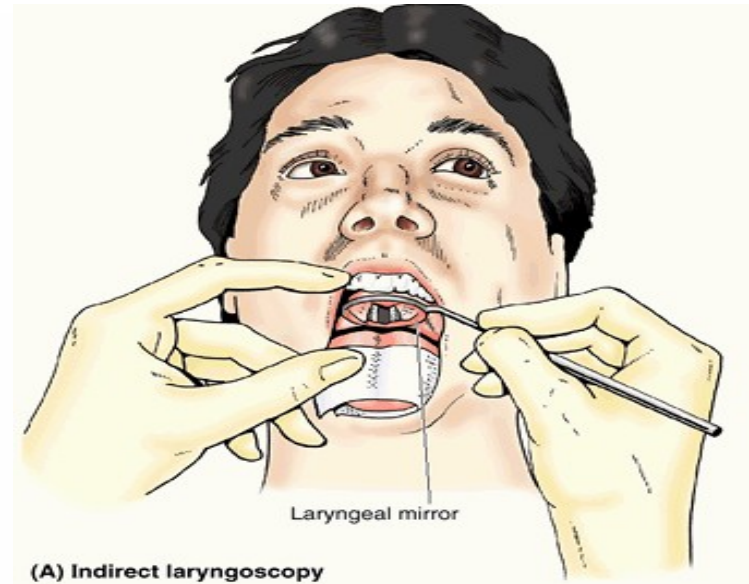
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Inspection of the vocal folds (cords)

(A) indirectly through a
laryngeal mirror
(B) through a
laryngoscope

Note the orientation of the structures forming the laryngeal inlet.

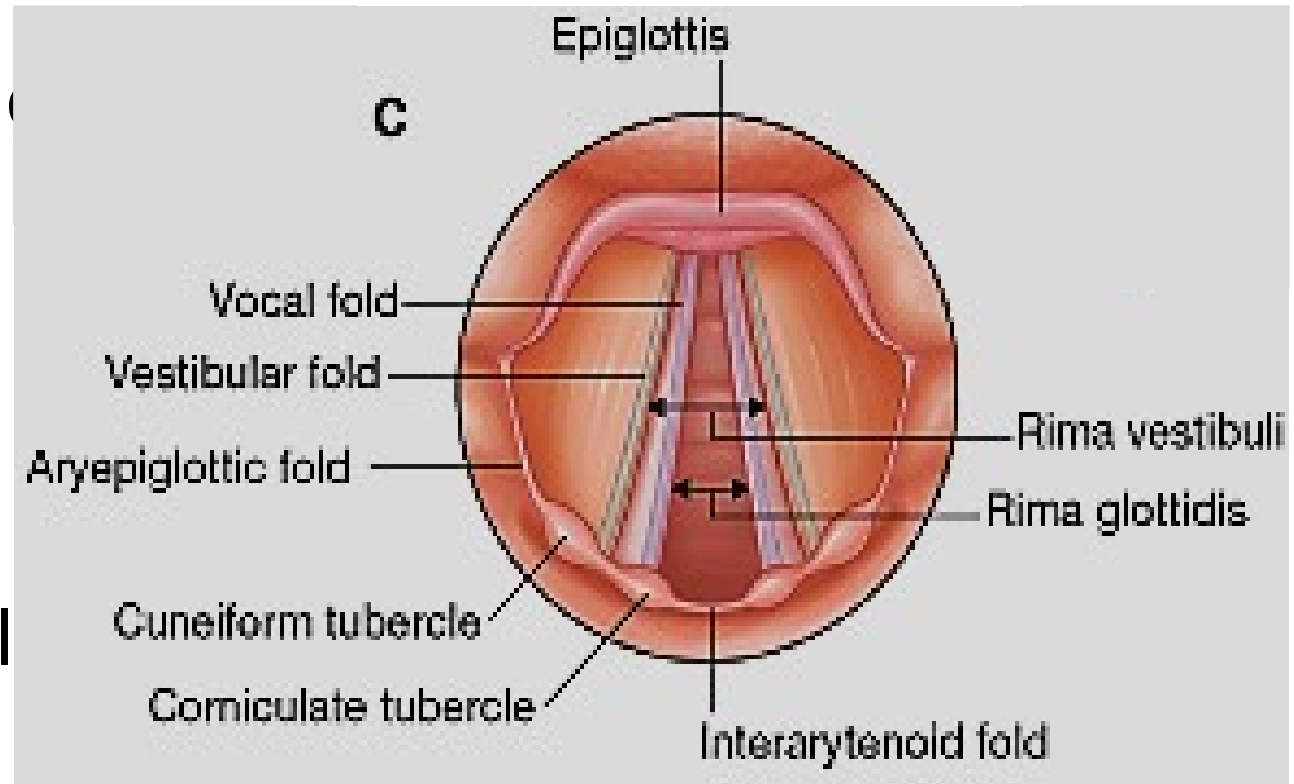


The Rima Vestibuli:

it is a triangular-shaped opening between the two adjacent vestibular folds

The Rima Glottidis

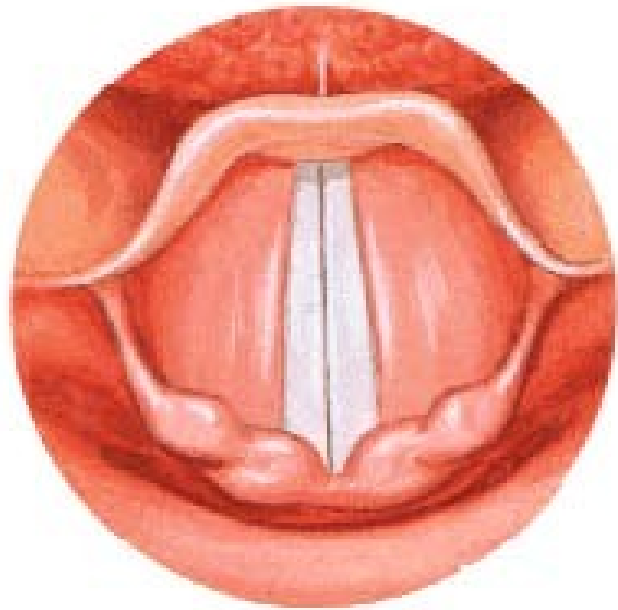
it is a narrower triangular opening between the two vocal folds.



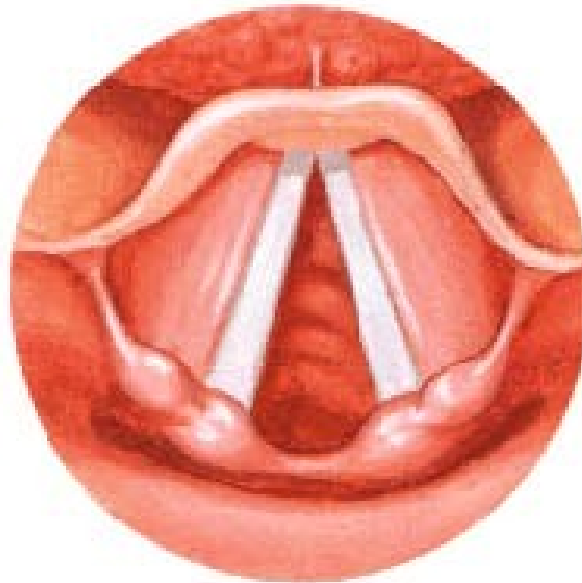
Clinical Anatomy for Medical Students .Richard S. Snell

Movements of the Vocal Cords

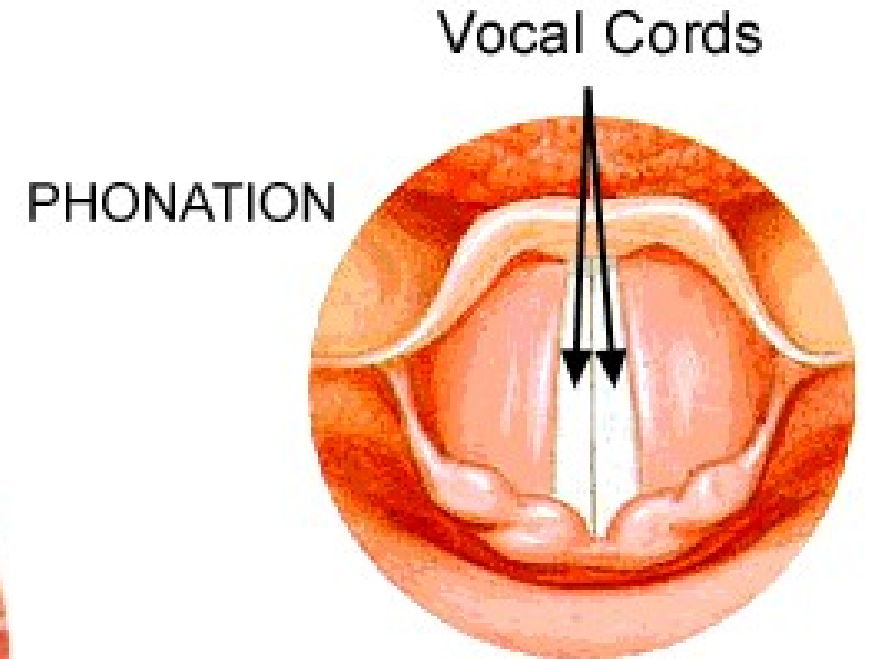
- Adduction
- Abduction



Folds closed (adducted)



Folds open (abducted)



Glottis (space
between folds)

*Clinical Anatomy for Medical Students .Richard
Snell*

MUSCLES OF THE LARYNX

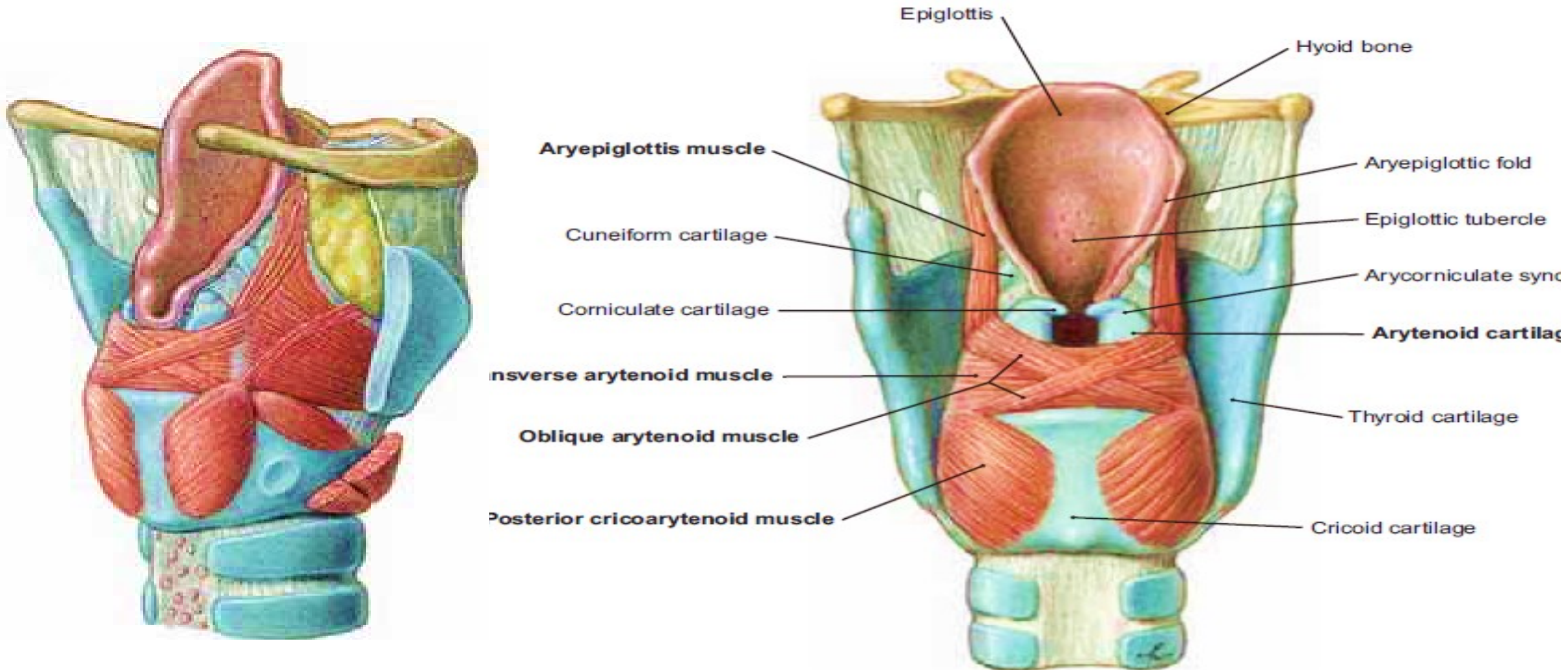


They connect different cartilages together

Their actions are :

1. adjust tension in the vocal ligaments,
2. open and close the rima glottidis,
3. control dimensions of the vestibule,
4. facilitate closing of the laryngeal inlet.

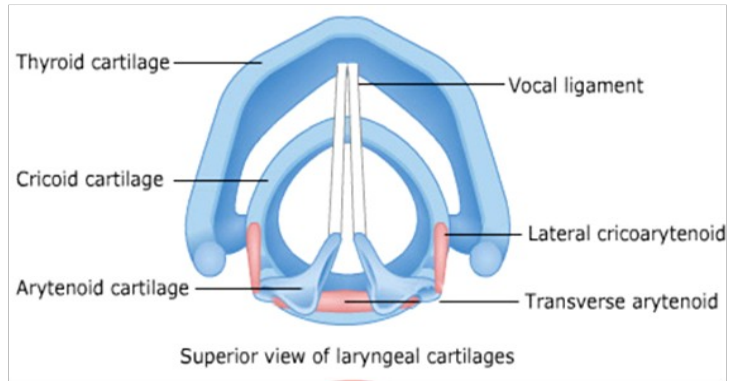
MUSCLES OF THE LARYNX



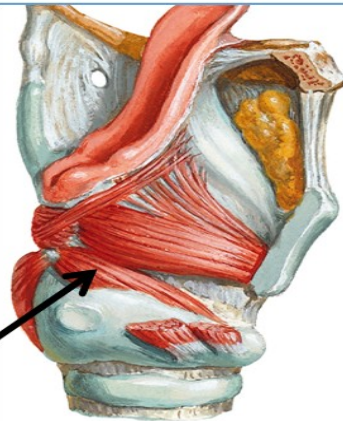
MOVEMENTS OF MUSCLES OF THE LARYNX



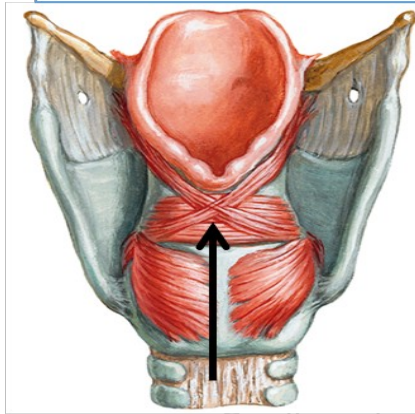
Adductors



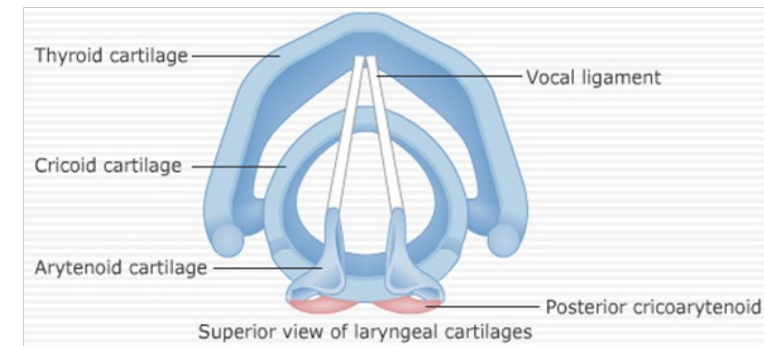
Lateral crico-arytenoid



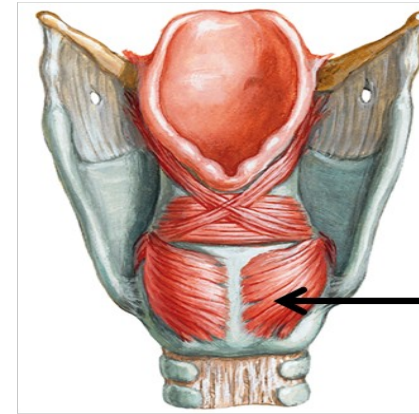
Transverse arytenoid



Abductor



posterior crico-arytenoid



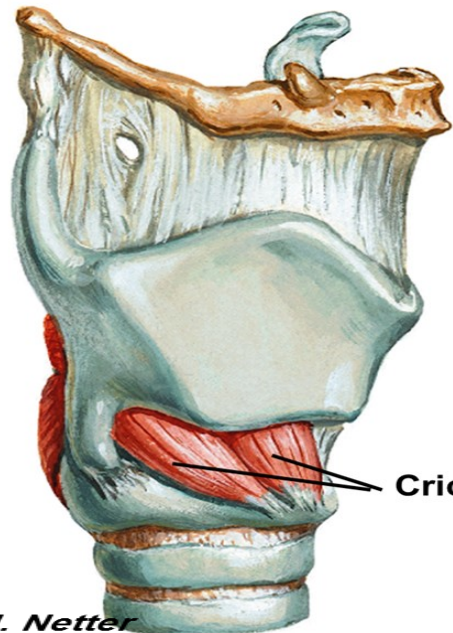
MOVEMENTS OF MUSCLES OF THE LARYNX



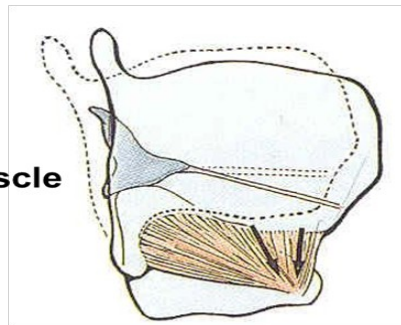
Increasing the Length = Tension
of the Vocal Cords

Muscle shortening = relaxing
the Vocal Cord

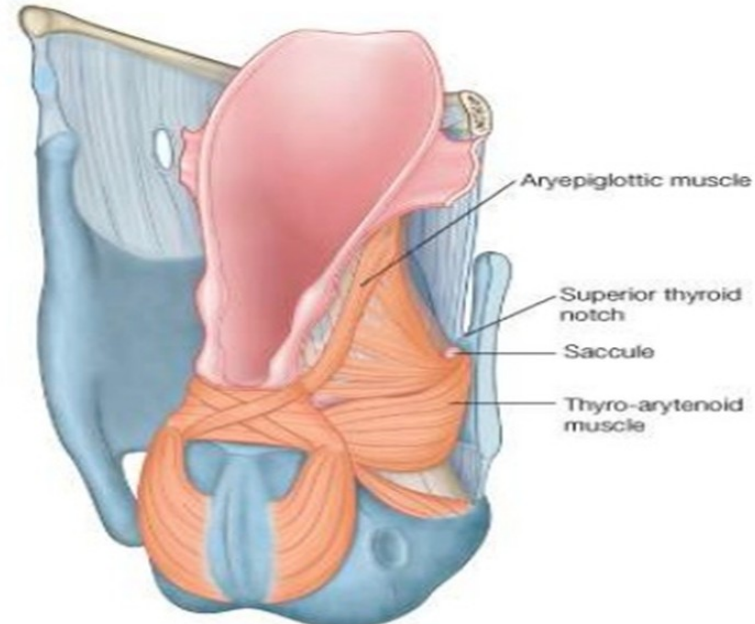
Cricothyroid muscle



Cricothyroid muscle



Thyro-arytenoid muscle



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NERVE SUPPLY OF THE LARYNX



Vagus nerve

NERVE SUPPLY

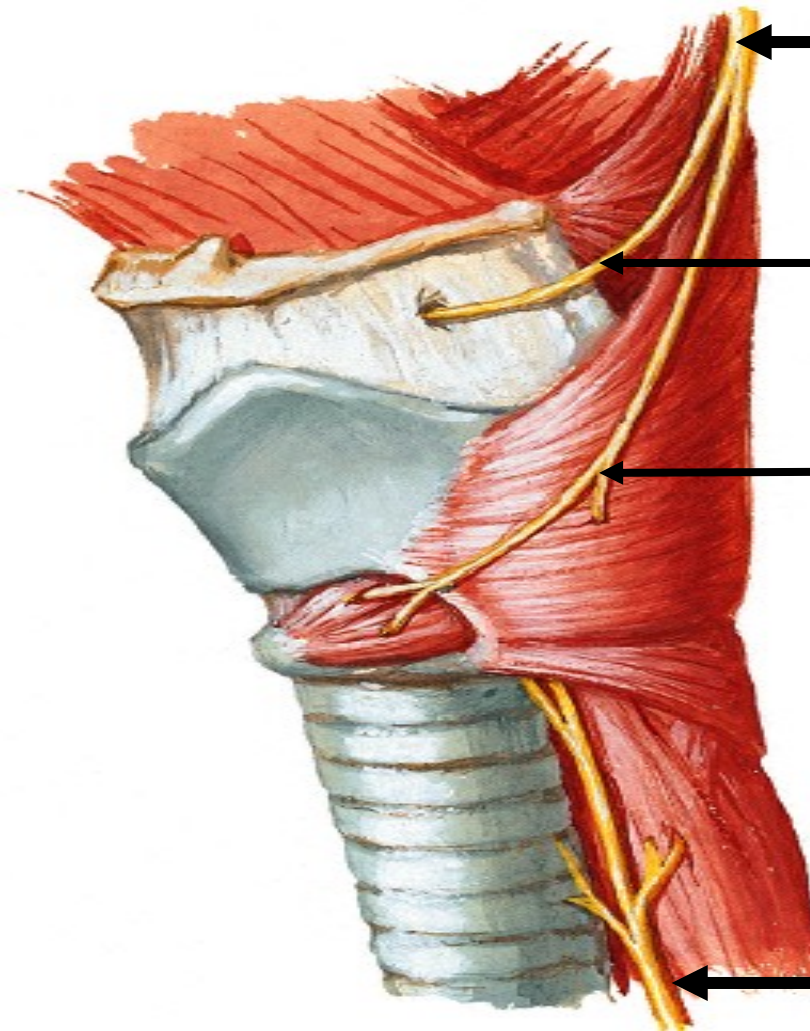
Internal Laryngeal Nerve :

only sensory

External Laryngeal Nerve :

only motor

Recurrent Laryngeal Nerve : sensory and motor



Superior
laryngeal N.

Internal
Laryngeal N

External
Laryngeal N

Recurrent
Laryngeal N.

NERVE SUPPLY OF THE LARYNX



Motor supply:

ALL laryngeal ms. → by **recurrent laryngeal n**
except ***cricothyroid*** → by **external laryngeal n**

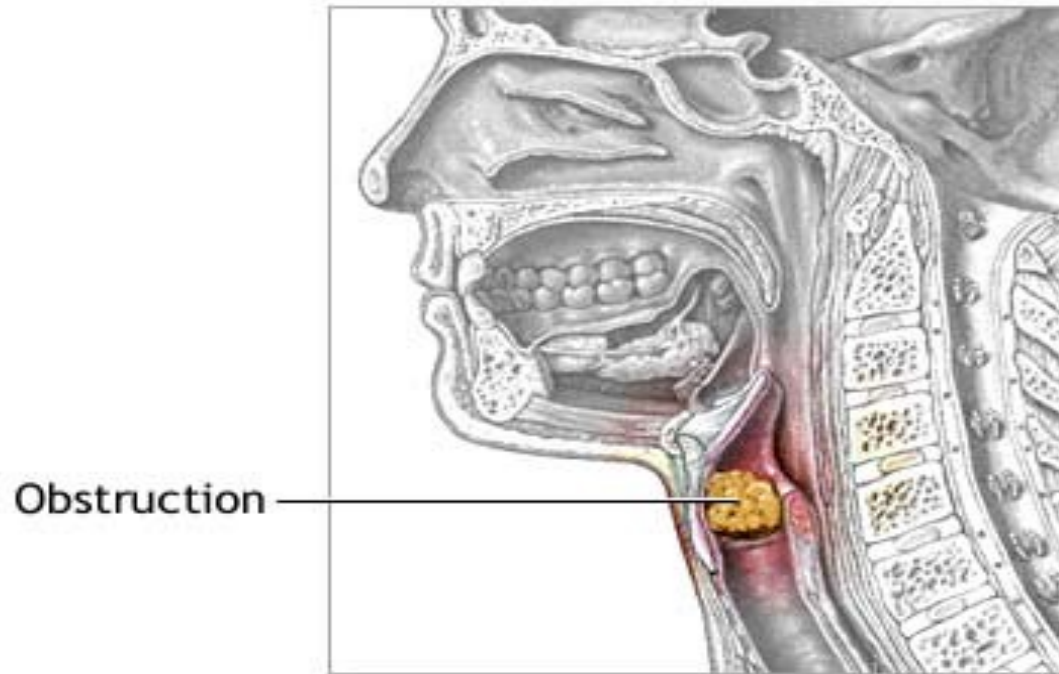
Sensory supply:

the mucosa **Above Vocal Cords** is supplied by **Internal Laryngeal Nerve**

the mucosa **Below Vocal Cords** is supplied by **Recurrent Laryngeal Nerve.**

What happen if a foreign body accidentally enters larynx ?

Universal sign
of choking



ADAM.

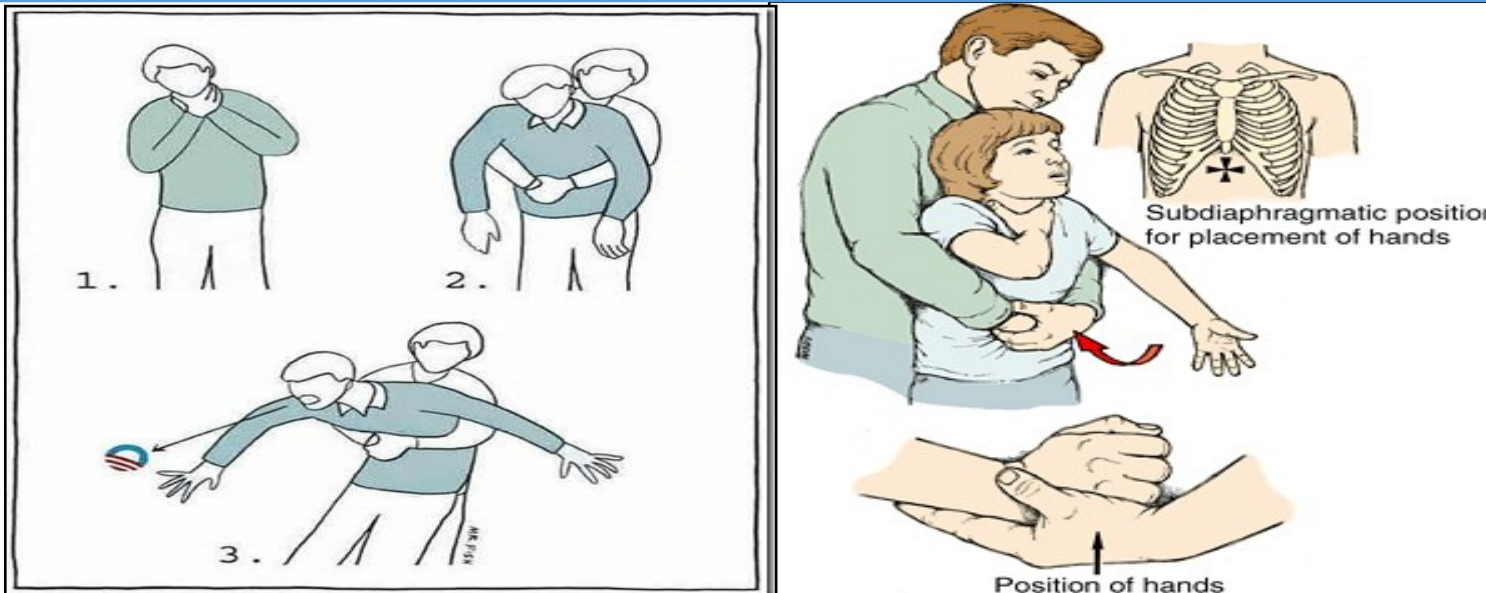


Different Procedures for Removing Foreign Bodies in Adults and Children

all maneuvers are directed toward the increase in intra-thoracic pressure to expel the foreign body from the airway.

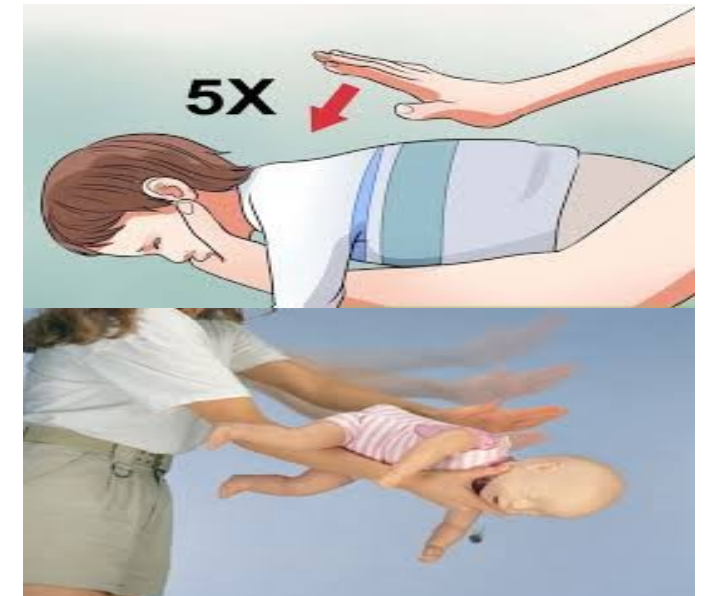
(Heimlich maneuver)

children older than 1 year and for adults



<https://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja&uact=8>

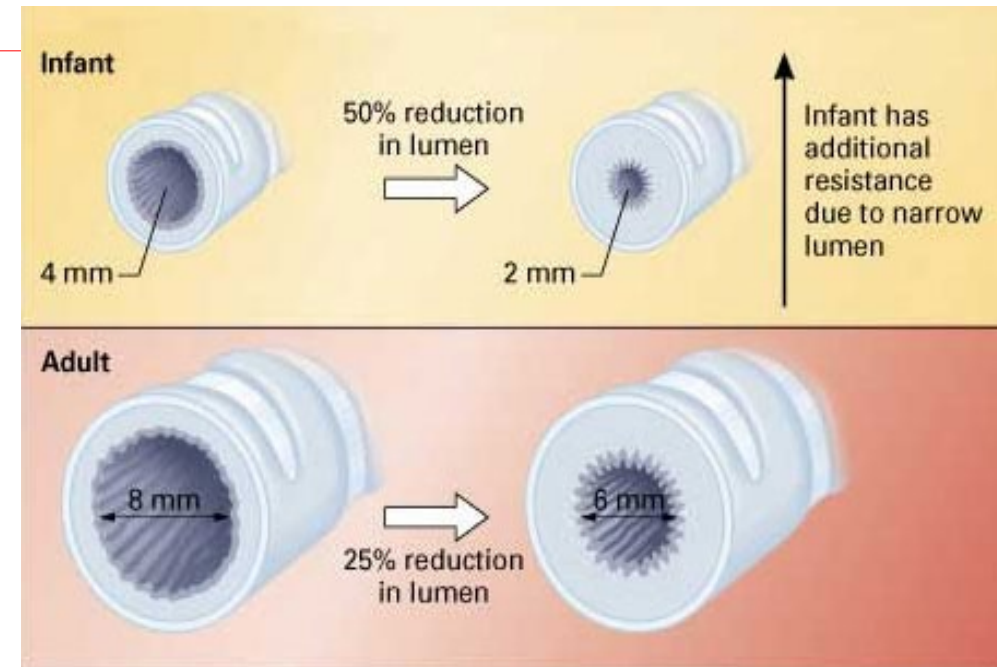
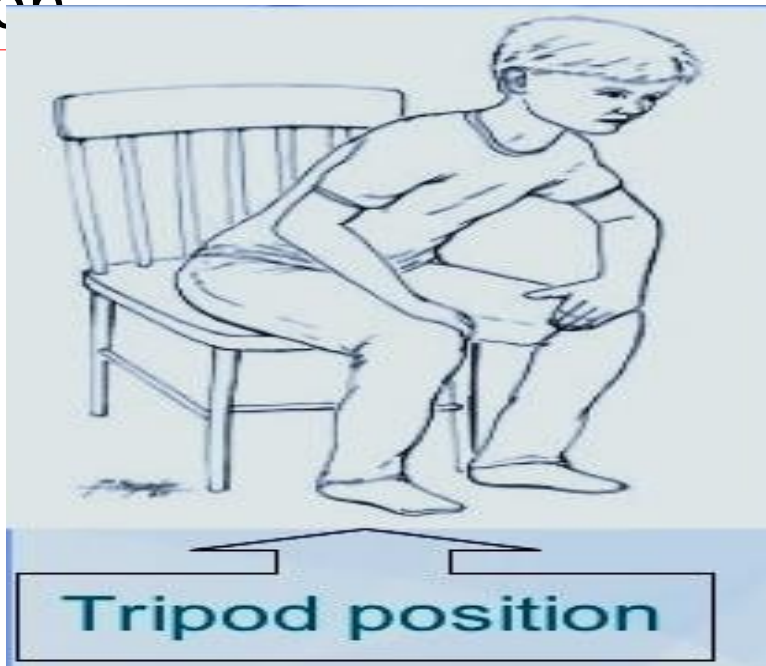
Children younger than 1 year



Epiglottitis

An acute inflammatory swelling of the mucous membrane of the epiglottis which can compromise the upper airway.

The inflammation may spread rapidly in the loosely arranged submucosa down to the vocal cords. The condition is most often seen in children where the narrow passageway quickly leads to upper airway obstruction.

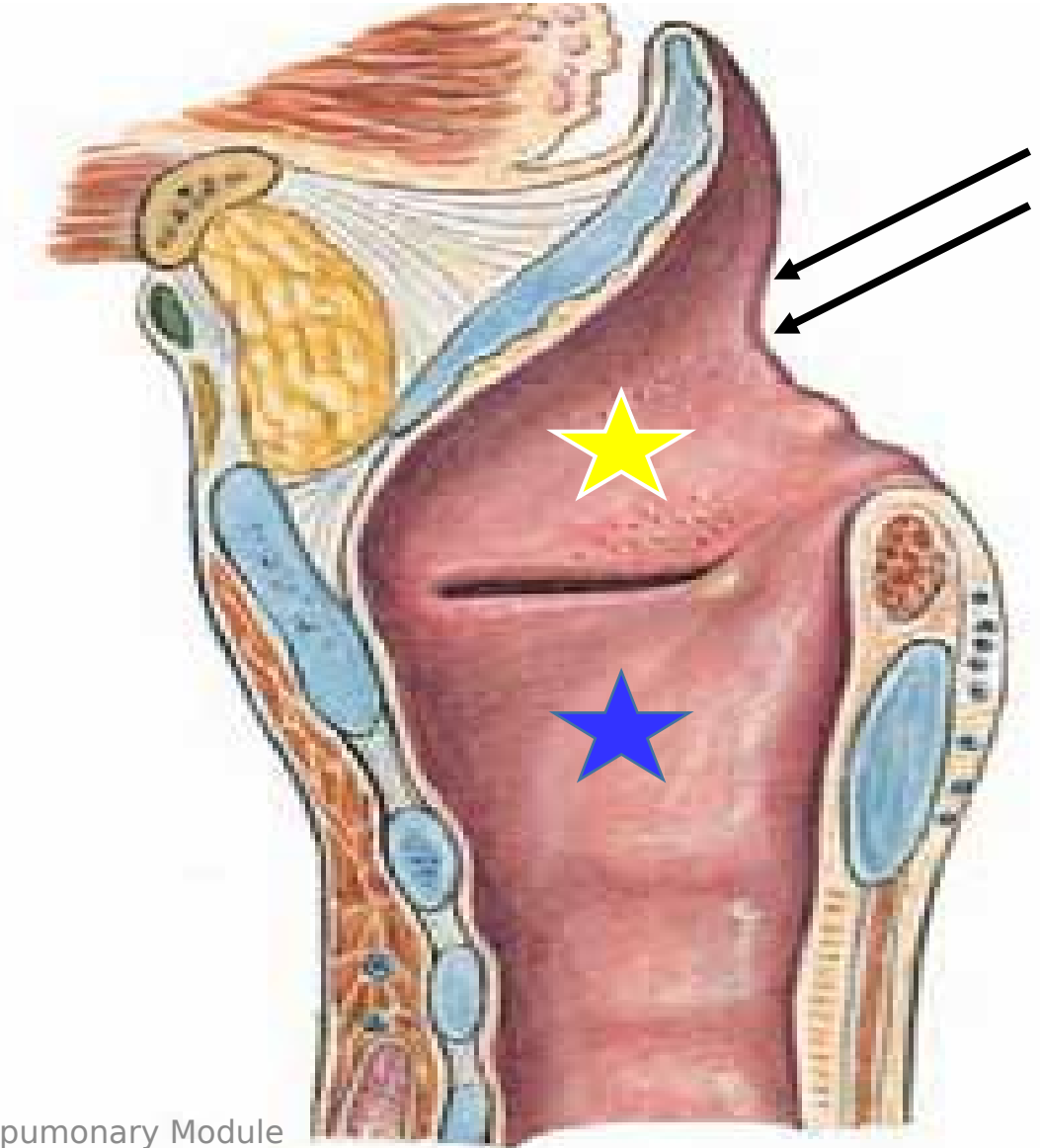


<https://www.google.com/url?sa=i&rct=j&q=&esrc=s&source=images&cd=&cad=rja>

Lecture Quiz



Identify the following structures



SUGGESTED TEXTBOOKS



Clinical Anatomy for Medical Students .Richard S. Snell

Gray's anatomy for students .